COAL AGE

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Facts vs. Insinuations

NO ONE is surprised, of course, that coal is being investigated by Congress. When the scenes were the wildest last summer every one in the business was mentally getting ready for what has come to pass. The one regrettable thing about it all is that the investigation should be in such openly hostile and superficial hands. No one can blame the coal-consuming public for turning with hopeful eyes to Congress for some remedy for such outrageously high prices as were charged for both bituminous coal and anthracite last year. The high prices having been charged, no matter how many or how few were culpable, an investigation is in order.

The coal industry has no objection to being examined, but it would like to have a fair and honest taking of the facts and a just verdict. The Calder committee gives no promise of doing either. Every possible effort is made to so construe the acts of the coal operators that they will appear improper. The Senators may dig deep enough with the assistance that is offered to show them the facts in a different light than that under which they are working; they may find that the coal man is not wholly bad, that there are things he can do and things he cannot do—it is conceivable that by persistence they may learn much from their hearings.

But what of the press agent of the committee? Will he not lose his job if he cannot produce headlines for the papers? Of what use will he be if he cannot each day turn the limelight on such dark and deeply-covered deeds as giving assistance to the Geological Survey so that the continuity of certain valuable statistics might be assured or helping the Interstate Commerce Commission—as the officers of the National Coal Association did—in preparing orders to the end that the commission might have its wishes carried out, being of itself without the essential technical knowledge to make its decisions workable?

To prejudge is a serious matter. Can it be denied that the Calder committee has done this very thing? Almost on the opening day of Congress each of three Senators on the committee gave out prepared statements denouncing the coal men as barons, robbers, thieves. Then they started a hearing to prove their statements.

The country is warranted in expecting something more from the Senate committee than mere exposés of graft among officials who used their position for gain in handling government purchases of coal. Such things as well as the high prices charged by shippers of coal are incidents—only the surface effects. What are the causes beneath all these things? The high price was but the fever, the graft but the raving of the patient. What is wrong at the bottom?

Let the committee, having gone thus far, having intimated every possible wrong motive and evil power to the coal industry, get all the facts and then let Congress decide whether the condition is temporary or whether it bids fair to be permanent. If it is likely to occur again, what should be done to prevent a recurrence—shackle the industry, legislate it into bankruptcy or give it and the country sufficient transportation so that competition may have full play and the consumer cheap coal?

Success Dependent on Service

ORGANIZED originally as a war measure to decrease car detention at ports and thereby increase transportation and the production of bituminous coal, the Tidewater Coal Exchange—as now confined to the ports of New York, Philadelphia and Baltimore—has since the war taken on a new significance as a semi-public institution. Financed on a "fifty-fifty" basis by the railroads and a volunteer group of coal shippers—by the railroads, because of its tried and proved value as a means of intensifying the use of coal cars and by the shippers to help accelerate the movement and production of coal, thereby increasing their opportunity to profit—the organization is threatened with disintegration because it has not recognized its public responsibility. An institution dealing in an organized way with the coal of thousands of consumers, and handling the product of hundreds of mines, has many bosses in its management and encounters many complex problems in serving such an extensive clientele.

The present organization will stand or fall on its record of service. It is being judged, in fact, solely by the measure of service rendered and the recognition given to the individual coal shipper and to the public nature of its relationship to coal consumers, who must depend upon its integrity.

Unless the classification of the mines and the inspection of the coal are conducted in such a way as to insure public confidence—unless the pool numbers on coal are given a stamp of authority as to quality—the incentive to work through the exchange will disappear and shippers will withdraw. It is one thing to ship through a pool when the market will take any kind and quality of coal, but it is quite another thing to meet real competition with pool coal not properly classified and inspected.

Supporters of the New York Exchange have recently advanced the idea of a similar organization for the port of Charleston, S. C. (*Coal Age*, this issue, page 25), and it is to be hoped that such a co-operative arrangement can be perfected and that port given added importance as an outlet for American coal Those considering the project should proceed carefully, taking advantage of the experiences of the oldest private exchange and overcoming its obvious shortcomings, as has largely been done by the exchanges at Hampton Roads, three in number.

The management—and by management we mean the Board of Directors—of course, is responsible for such suspicion and lack of confidence as exists in the New

York exchange. We believe all this could have been avoided by a proper spirit of willingness to take into fuller confidence those of the public interested in its work. One cannot refrain from comparing the open, frank methods of conducting business adopted by the Lake Erie Coal Exchange to the star-chamber secrecy of the New York Tidewater Coal Exchange.

The office of the Lake Erie exchange is a gathering place for those using its facilities, every record is open to inspection and its officers are always available for conference. The New York exchange has a policy quite the contrary.

Recognition that an institution presenting the opportunities for good and for abuse offered by an association such as the Tidewater Exchange cannot be conducted like a strictly private business enterprise will be a forward step.

Still Another Burden for the Essential Industry

DECLARING that essentials must be kept in operating condition by the retention of all skillful employees, the Kansas Industrial Court has directed the flour mill that laid off its men for lack of work to grant wages during the period of idleness. Its decision is not based on the needs of the men or the rights of labor but on the necessity that essential industries be kept in condition to work by the retention of their skilled employees.

One cannot but fear that the public will approve the decision, for it has long regarded essential industry as a mule to be restrained by bit and bridle and loaded down by burdens. The public in general has come to the conclusion that the essential industry is established for service and must patiently render it. The other industries are created for profit and not for service and should not for one moment be held to any responsiblity whatever.

The public says in effect "That's the way I feel about it," and leaves the matter there, but, fortunately or unfortunately, the question cannot be so settled. Nor can it be met by asking how the essential industries feel about it. Basally it is not merely a matter of justice but one of economics. At the bottom the problem is, Will the essential industry continue to function and function satisfactorily under this discriminating regulation which fixes its wages, its profits, its manner of doing business and which now would compel it to work at a loss or pay wages to its idle employees?

If there are any industrial rights they rest surely with corporations rendering important public service. If there are any institutions that should be helped by profitable operation to expand and develop, it should be those industries on which others rest. Surely they should not be singled out for special restrictions.

We hear now that the railroads have recently been earning only 81 per cent of the 6 per cent promised them. That is less than 5 per cent on their capital. Their income, moreover, is diminishing. It would be considered an offense against the public to give them an increase in rates to meet the diminishing volume of their business, but when money is quite generally able to earn 8 per cent on industrial bonds the railroads should be allowed to receive at least 6 per cent, especially in view of the fact that 5½ per cent is the limit they are allowed to distribute under the Esch-Cummins Act.

The Heart of a Coal Operator

CERTAIN of the public and that union which is known as the United Mine Workers of America would be disposed to say that he who would write about the heart of a coal operator would write about something which does not exist. But perhaps a comparison may be permitted as a means of arriving at a more correct conclusion.

There are three main employments for the crude labor from Europe—the contracting business, the coal industry and the steel works. In none of the three are men treated better than in the coal industry. Some people have bitterly condemned the housing in the towns that a past generation of coal operators constructed. Rents indeed were high and the habitations sometimes were unfit for human occupation.

As for rents, they are now low even for the shacks of a past generation. All the new houses are eminently habitable. Conditions in mining towns compare most favorably with those in the contracting business, where men are crowded in long sheds, dark and dirty, and without any culinary accommodations. Miners often refer to the method of living in the shacks of contractors as to an existence far below their own.

Then again no boss is more surly and more arbitrary than the boss on the grade or the foreman on a construction job. Nowhere is the theory more ruthlessly accepted that a man must be abused and spurned or the best of which he is capable will not be forthcoming. Bosses on the grade have the manners of slave drivers. Compared with them the mine foreman is urbane and human. It is true that he still lacks—he is still overcome with brief authority—but he is far more responsible than the average excavation foreman.

The mine operator is a peculiar fellow. His head works one way and his heart another. His men may go on strike and their continued occupation of the houses that he has built for the use of actual workers may lay his mines idle, but he hesitates to displace the idlers for active men. In the Ohio strike the men remained in their houses for thirteen months, yet the rent probably never was paid even after the strike was over. In a central Pennsylvania strike the miners, hard pressed to get food, went to the company store and asked for the use of the company delivery wagons and mules so that they could make a house-to-house canvass on the farmers who at that time were sympathetic, for they did not know then, as they do now, that the miners when working make more money than they.

In Mingo County, West Virginia, many of the strikers have been living in company houses for months. They have been paying no rent, and where the company furnishes water and other conveniences before the strike these services have not been discontinued so long as the tenants have paid for them. Some of the companies offered to let the men go into the mines and dig coal for their own use and some even offered to haul the coal with the company teams, and this would have been done, but the idea of the union was to make conditions as pitiable as possible, in the hope that the public would be led to interfere and demand that the "shiver strike" be ended by a capitulation of the operators to the demand of the union.

Much corporational housing has for years been devoid of profit. It is a great shock to the ex-employees of many firms when they rent a home from a private individual and pay far more for less accommodation.

British Oxygen Mine-Rescue Apparatus Is Said to Remedy Many Existent Faults

Oxygen Valve Can Be Reached Only by Key and Cannot Be Turned Inadvertently—Oxygen Flow Regulated by Resistance of Cotton Wool to Avoid Possibility of Clogging by Rust or Dust—Air Comes to Purifier Warm and so Chemically Active—Purifier Walls Are Insulated

BY JAMES COOPER*
Edinburgh, Scotland

AFTER seven years research conducted under the auspices of the British Department of Scientific and Industrial Research, a new breathing apparatus—the Briggs—has been evolved. The experimental work was performed under the directorship of Dr. Henry Briggs, Heriot-Watt College, Edinburgh, Scotland.

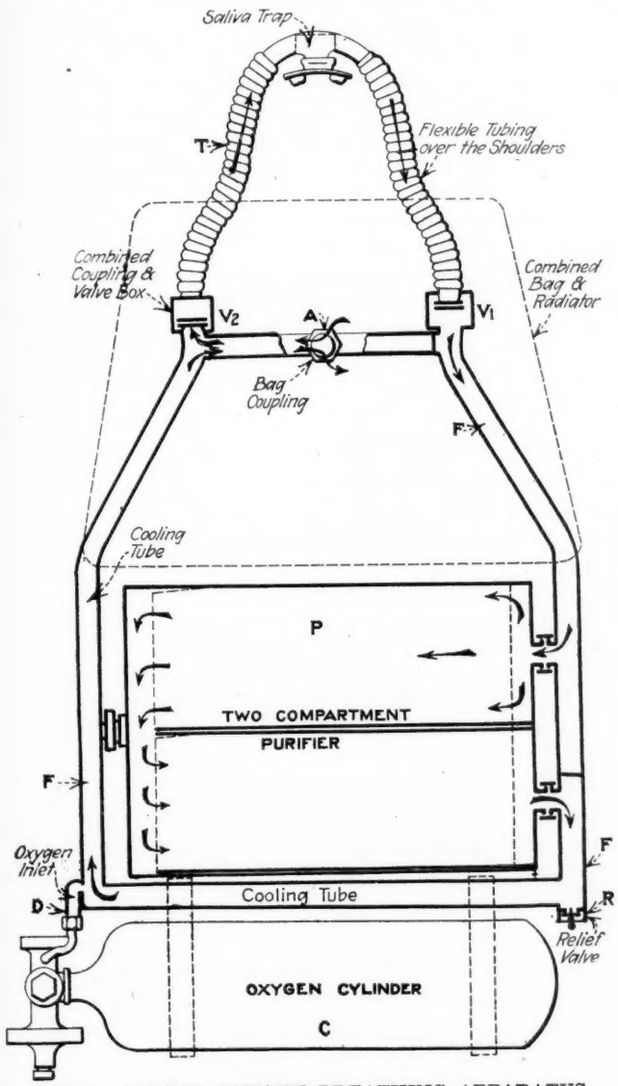

FIG. 1. BRIGGS OXYGEN BREATHING APPARATUS

There is a great similarity in the main lines of all apparatus, so much so that it is hard to tell one from the other by a generalized illustration like that shown. The differences are in the details. The air expired goes to the purifier and is deprived of its carbon dioxide, thence to the cooling tubes, where the heat of purification is removed. Oxygen is added from the oxygen cylinder, and the air then enters the breathing bag, a storage vessel, from which it is drawn by the wearer whenever he fills his lungs.

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As now developed the apparatus is so constructed as to give an ample supply of air of a high standard of purity at a comfortable working temperature. At the same time the design is such that it insures maximum freedom to the body of the wearer and requires from him a minimum of attention. The main purpose has been to provide an apparatus that satisfies, with a considerable margin of safety, all the stringent requirements set forth in the first, or 1918, report of the Mines Rescue Apparatus Research Committee. That committee consisted of W. Walker, chief inspector of mines; Dr. J. S. Haldane and Dr. Briggs.

The apparatus is described in the recent second report of the Research Committee, from which the accompanying illustrations are taken. Figs. 1 and 2 show respectively the flow diagram of the apparatus and the general arrangement when in place on the wearer.

BYPASS ENABLES WEARER TO SUPPLEMENT SUPPLY

The oxygen supply to the circuit has been fixed for normal working at a uniform rate of two liters per minute, but this can be increased at any time by means of a bypass. The method of supply of this essential element for a breathing apparatus has been subjected to extensive research and the merits and shortcomings of the self-regulating devices of Garforth in England and Gibbs and Paul in America, as well as the device by which the delivery is adjustable by the wearer, have been fully considered. For various reasons the uniform supply, controlled at will by means of a bypass, has been adopted in the Briggs machine.

As with the Tissot and Gibbs, this apparatus is placed entirely on the wearer's back, being supported by a framework built up of light steel aëroplane tubing, 1 in. in diameter and weighing ½ lb. to the foot. This framework is ingeniously designed so as to serve a dual purpose—as a support and as an air circuit. As it forms the major part of the tubing provided for the passage of air, it presents a large cooling surface. The body belt and shoulder straps are composed of infantry belt webbing attached to the frame by spring hooks and adjusted by a simple device.

The mouthpiece, purifier *(P)* and flexible tubes *(T)* (Figs. 1 and 2) make up the other portions of the air circuit. The tubes are of army pattern and highly flexible, with no metal entering into their construction. Air (see Fig. 1) starting from the mouthpiece passes through the valve (V_1), circulates through the purifier, flows along the part marked "cooling tube" and into the bag at *A*. The oxygen enters the circuit at *D*.

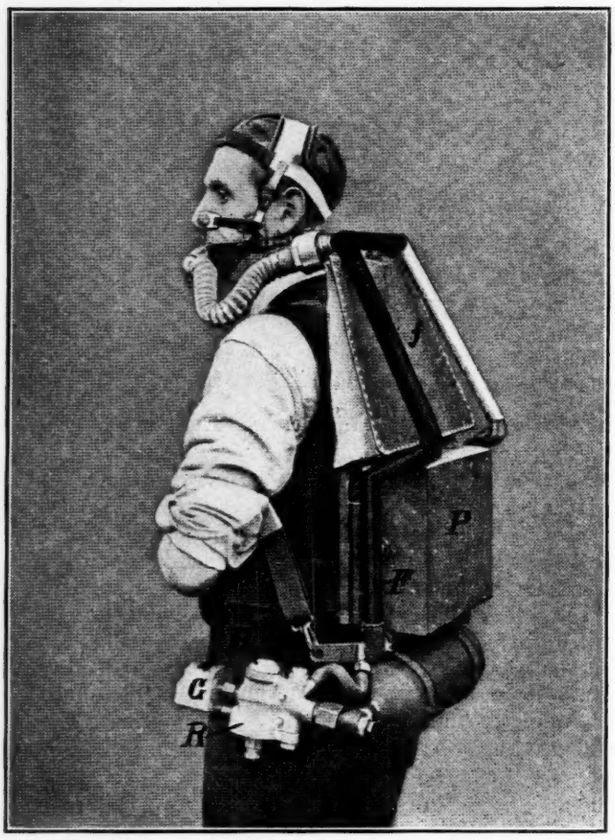


FIG. 2. APPARATUS ON RESCUE MAN

Note the tube on the far side of the apparatus. It connects the flexible expiratory tube with the purifier. Because the caustic absorbs carbon dioxide from warm air more readily than from cold air this tube is kept bright, so that it will not radiate heat unnecessarily but will pass it on to the purifier as near body heat as possible. The other metal tube is a cooler, and it is blackened so as to be of utmost efficiency in reducing the temperature of the air.

The oxygen cylinder is made of a high grade of carbon steel and is constructed to Dr. Briggs' specifications. It is 13 in. long and 4½ in. in diameter with a capacity of 290 liters at 120 atmospheres and 360 liters at 150 atmospheres pressure. It weighs, exclusive of the valve, 7 lb. The larger volume of oxygen can be used in actual rescue operations and the smaller for practice purposes.

The test pressure is 225 atmospheres, and the steel has an ultimate tensile strength of forty to fifty tons and a yield point of twenty-three tons per square inch. Not only its light weight but also the method of attaching the cylinder is worthy of note. This attachment is made by means of two stout leather straps to the lower horizontal tube of the frame. Metal loops prevent it from shifting laterally. This is particularly helpful while crawling in low workings, as the attachment, being elastic, permits the cylinder to fall into contact with the body, thus preventing bumps and jars.

Sunk-Spindle Cylinder Valve with Cap

My own experience in rescue-station work has shown that the wheel type of valve on the oxygen cylinder is both dangerous and inefficient. The adoption of the sunk-spindle valve on this new apparatus, however, has eliminated all trouble from this part of the machine. The valve (Fig. 3) is made compact and light in weight but of ample strength. The leader of the team who carries a key (Fig. 4) unscrews the cap *(A)*, turns the spindle *(C)* to allow the flow of oxygen and then replaces the cap. This insures non-interference, provides against accidental closing and prevents leakage along the spindle.

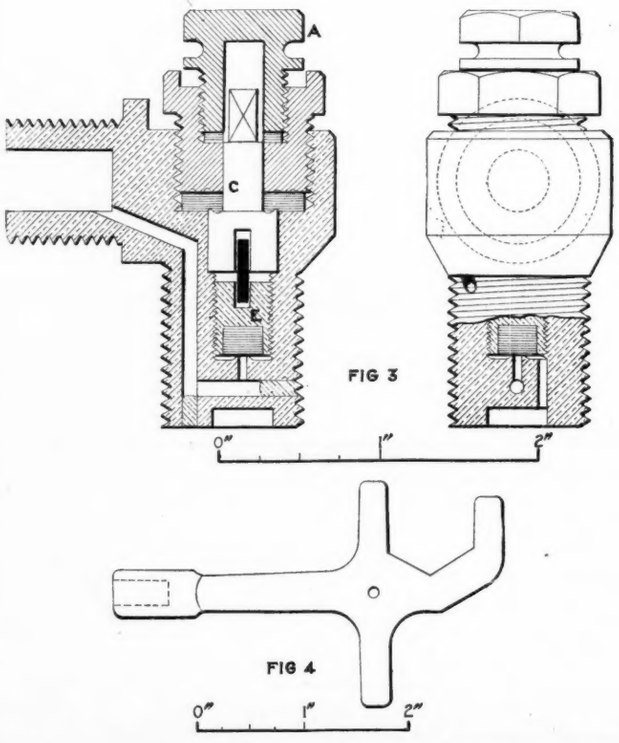
A conspicuous departure from methods followed in all other apparatus is the control of the oxygen. The device proper (Fig. 5) comprises a reducing valve, bypass, pressure-gage and flow-meter. Combining lightness with the necessary strength, the high-pressure part is of gun-metal and the remainder of aluminum. An interesting constructional detail is the casting of the aluminum direct upon the gun-metal center, making a mechanically strong and gas-tight junction of the two metals.

The reducing valve *(R)* is of the single-lever type with a metal diaphragm *(A)*. This is a 2-in. german-silver aneroid diaphragm which, being highly susceptible to pressure changes, allows of a delicate regulation. From the reducing-valve box the oxygen passes through a resistance or into the bypass space and thence through a 4-in. piece of strong rubber tubing into the breathing circuit.

Bypass Operated by Pressure of Thumb

The bypass *(B)* acts instantly; it opens to pressure of the thumb and shuts by means of a spring as soon as pressure is released. This is a marked simplification compared with other machines, as no wheel valve has to be operated. It also has the added advantage of instantaneous opening and closure.

The gage *(G)* has two reading points and a double scale; one registers the cylinder pressure and the other the rate of discharge of oxygen in liters per minute. A non-inflammable celluloid window protects the pointers and scales. To enable the wearer to make readings in darkness the points of the scales at 120



FIGS. 3 AND 4. VALVE AND KEY OF OXYGEN CYLINDER

The spindle of the valve C is sunken and covered by the cap A. By means of the key shown in Fig. 4 the cap can be removed and the spindle turned. In this way the spindle cannot be revolved inadvertently or by anyone who does not have the key, and the cap prevents leakage along the spindle.

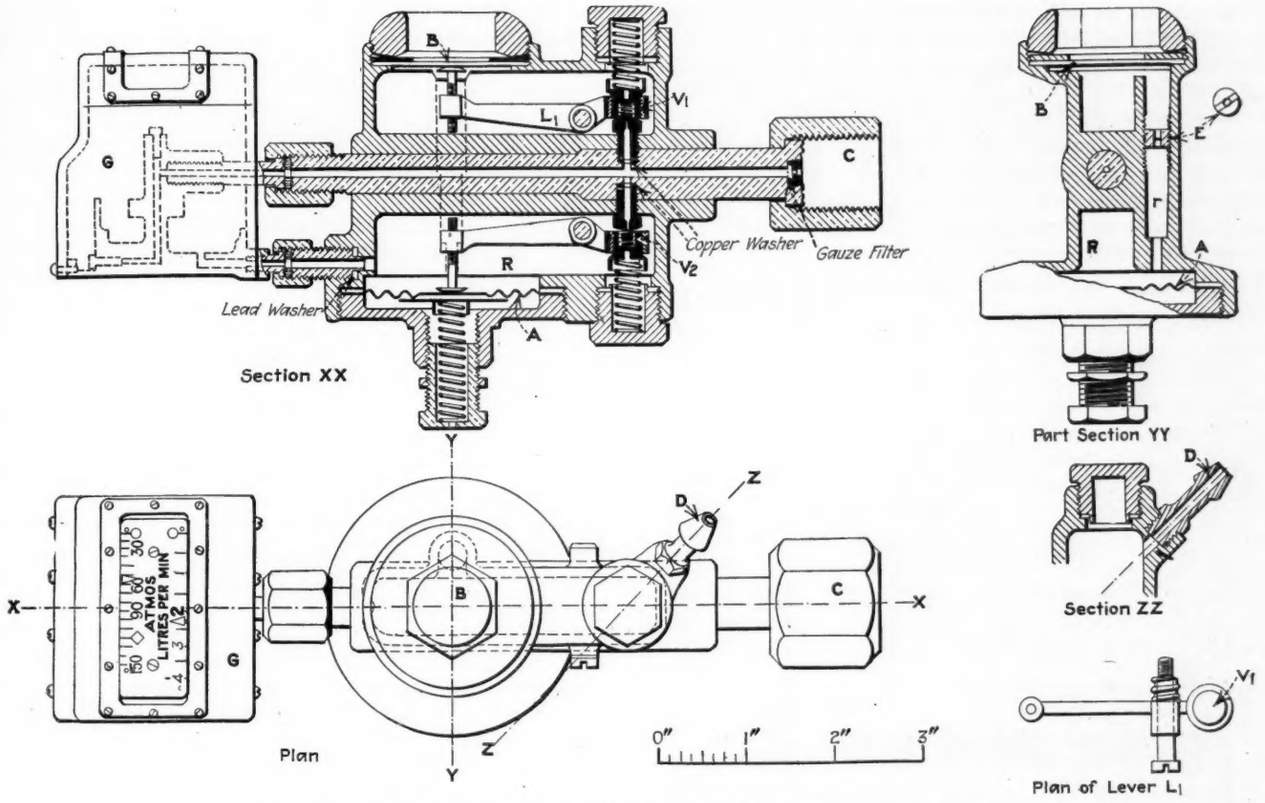


FIG. 5. DEVICE FOR CONTROLLING OF OXYGEN FROM CYLINDER

The small chamber or passage marked *r* on the right-hand side of the cross-section YY in the upper right-hand corner of this illustration is filled with cotton wool. The oxygen filters through this wool, the compression of which is regulated by screw E. This form of obstruction is believed to be of such a character that it is not likely to be made as variable as an ordinary passage, for a small piece of rust or dust cannot close it off. The bypass B is actuated readily by the pressure of the thumb without the use of a wheel valve. By use of illuminated points on the scale and illuminated pointers provision is made for reading the scale in the dark without other light. Fig. 2, on the preceding page, shows the exact position of the gage (G), the reducing valve (R) and the bypass (B) when the breathing apparatus is in use and secured to the person of the wearer.

atmospheres pressure and 2 liters flow and also the extremities of the pointers are tipped with luminous spots. All the parts can be immersed in water without rusting.

The whole of the valve mechanism is attached to the cylinder in one piece and by partaking of its swing, passes back from the arms when the wearer stoops or crawls. In the normal position of standing, however, the pointers can be read easily by the wearer.

Box of Cotton Wool Regulates Oxygen Flow

The resistance *(R)* is of a novel character; it is simply a box packed with cotton wool. The tightness of packing increases or decreases the resistance to the passage of oxygen and may be controlled by the screw *(E)*. This type of resistance provides a great number of paths for the flow of oxygen, and the danger that rust specks or other matter may choke the passage is entirely removed. Furthermore, with such a resistance the volume passing varies almost directly as the pressure, instead of being proportional to the square root of the pressure. For this reason the graduations in the scale on the flow meter are spaced almost equally, which is an advantageous arrangement.

In many forms of rescue apparatus the regenerator is faulty in one or more respects. We may summarize as faults or at least as disadvantages: (1) The absorbent material has to be shaken by the wearer; (2) the air resistance is excessive because the caustic swells and reduces the passage left for air; (3) the air for breathing is supplied in a wet state and at a high temperature; (4) difficulty is experienced in getting a perfectly airtight seal of the cartridge when refilling at the rescue station; (5) only part of the caustic comes into action or the arrangement does not prevent the absorbent from collecting at a particular part of the canister, depending on the position the wearer may temporarily occupy.

In the Briggs purifier all these faults have been eliminated and, as I can testify from experience gained in working tests, it is almost perfect in its action so long as the wearer, even though he be doing the hardest kind of work, does not exceed the period generally stipulated as the proper limit for the wearing of such an apparatus.

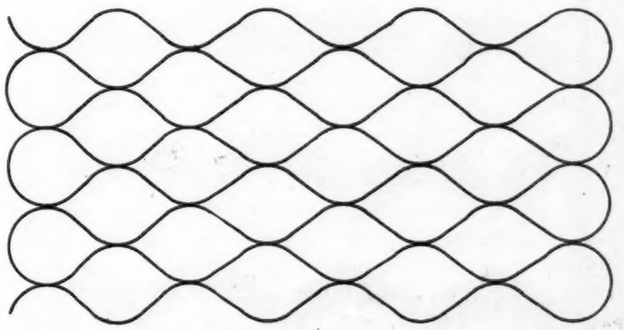


FIG. 6. CRIMP USED FOR CAUSTIC IN PURIFIER

One method of arranging the caustic so as to promote a rapid absorption of the carbon dioxide is to fashion it into thin sticks held in parallel crimps extending the full length of the canister.

The purifier is rectangular in shape and divided into two compartments by a horizontal partition. It is so constructed that no soldered joints come into contact with the caustic. The lid with a flange 1 in. deep fits over one end of the canister (see Fig. 2) and to provide for its sealing a thin strip of tin is soldered over the junction of the can and lid. To open, this strip can be ripped off quickly in a manner similar to that employed with sealed cans such as are used for ordinary commercial purposes.

Hexagonal Depressions Made in Gauze Trays

Several forms and methods of arrangement of the absorbent material have been tried. Thus the caustic has been fashioned into thin sticks in parallel crimps extending the full length of the canister (see Fig. 6). Another method found equally successful is that of imprinting hexagonal depressions in gauze trays (see Fig. 7). By turning the trays alternately end for end when pushing them into the carrier the ridges of one tray fit over a depression of the next. By this means the granules of caustic which lie in the depressions are kept in their proper place no matter how the cartridge may be shaken before use. This is a highly important practical consideration. Each carrier holds twelve trays measuring 7½ x 4½ in. The total weight of the purifier exclusive of charge is 4½ lb.

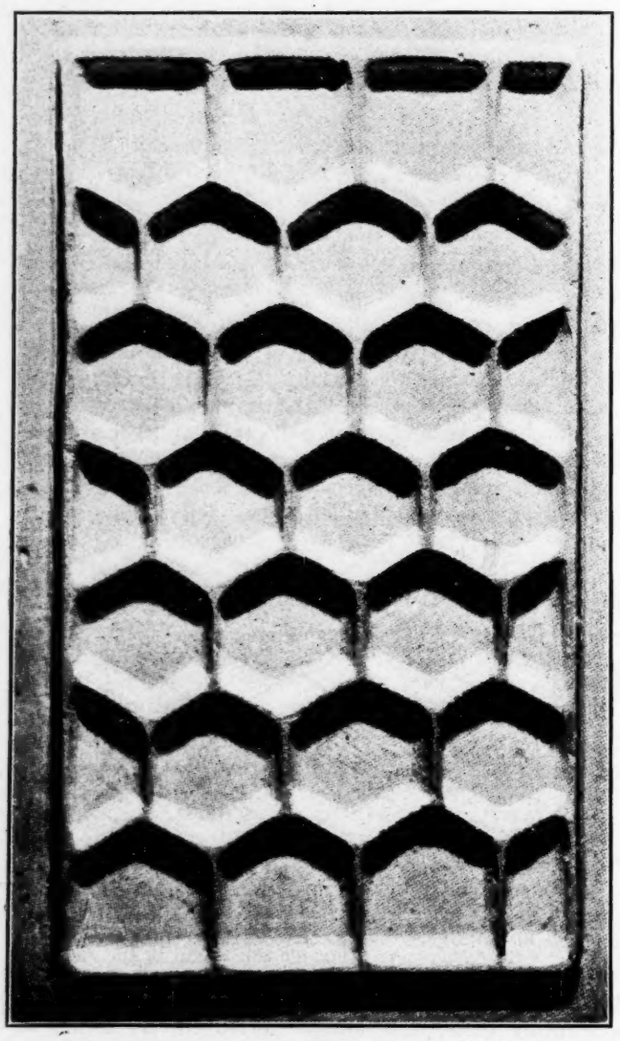


FIG. 7. GAUZE TRAY WITH IMPRINTED CAUSTIC

The trays with their imprinted hexagonal depressions are all alike, but by turning them alternately end for end when placing them in the carrier, a depression on one comes opposite a ridge on another and the expired air is caused to pass between them in a curved path, surrendering its carbon dioxide in its passage.

Three strips of blotting paper are used in each compartment of the purifier, one piece placed at the top and the others placed respectively at one-third and two-thirds of the depth. The latter strips catch and spread any drops of semi-liquid caustic falling upon them.

It readily will be understood that the type of purifier described, which enables the air to pass easily and slowly along a large number of paths of equal resistance and over thin layers of absorbent, will offer a lower resistance to the passage of the air and at the same time be highly efficient in extracting the carbon dioxide.

Two Pounds of Caustic for Nine-Mile Walk

The attachment of the regenerator to the frame is made by means of two strong brass unions fitted with hexagonal nuts. These are tightened by a key and insure a good joint. To prevent side movement of the canister a third point of support is provided at the end opposite to the unions. Here a strong brass pin makes contact with a simple catch.

It may be claimed fairly for this regenerator that its construction has solved a difficult problem in breathing apparatus, namely, the passage of an ample supply of purified air at a comfortable temperature and under an almost negligible pressure. As will be mentioned later, I have worn the apparatus with only 2 lb. of caustic in the can and with this charge have walked a distance of nine miles at a speed of four miles per hour without the least discomfort.

An entirely new departure has been made in this apparatus in the heat insulation of the purifier. The caustic receptacle has to be covered with insulating material so as to minimize the liquefaction of the absorbent. A number of particles in a fluid state dropping away from their proper positions in the trays would eventually create a path along which the air would pass without being properly scrubbed. This would increase the percentage of carbon dioxide in the inhaled air. The insulating medium is a single piece of leatheroid. Its method of attachment is shown in Fig. 8.

Bag of Balloon Fabric and Duralumin

The breathing bag is wedge-shaped and similar to that of the Gibbs apparatus. It has a capacity of six liters. The sides, bottom and back pieces are made of balloon fabric and the remaining side of duralumin* blackened by a chemical process for the purpose of affording a good radiating surface. This metal sheet possesses several advantages: (1) It helps to cool the air after issuing from the purifier; (2) it offers mechanical protection for the bag; (3) the weight of the metal maintains positive pressure in the circuit, except in the case of a large leak, when the bag would become completely deflated. The position of the uprights of the frame prevents the bag from being pressed flat should it come in contact with the mine roof.

Valves controlling breathing in the Briggs apparatus are of the Rosling pattern. Their construction and arrangement make them safe, efficient and foolproof (see Figs. 9 and 10). They are constructed of rubber and are fitted into boxes placed at the top of the frame.

*An alloy of aluminum, copper, manganese, etc. It is an extremely light alloy with the strength of mild steel.—Editor.

These boxes serve also as unions, being tightened by a key. To eliminate danger of tampering with the mouth tubes the connection of each valve can be made in only the correct way and then only if the valves are in place and put in the boxes in the proper manner. The relief valve (*R*, Fig. 2) is fixed near the exit of the purifier and is set to blow off a 4-in. water-gage pressure. It can be operated also by hand. Fig. 11 shows a section of the valve. It is well known that caustic at a low temperature is an inefficient absorbent, while at higher temperatures its efficiency rapidly increases. This property has been utilized in the arrangement of the frame of the Briggs apparatus. This frame is silver-plated and that portion lying between the expiratory valve and the purifier has been left bright. This arrangement reduces the amount of heat radiated by the expired air, and thus increases the chemical action of the absorbent and heightens the efficiency. On the other hand, the remaining part of the frame is sulphided so as to give it a dull black surface. By this means it acts as a cooling tube, thus insuring a supply of air to the lungs at a much reduced temperature.

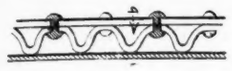
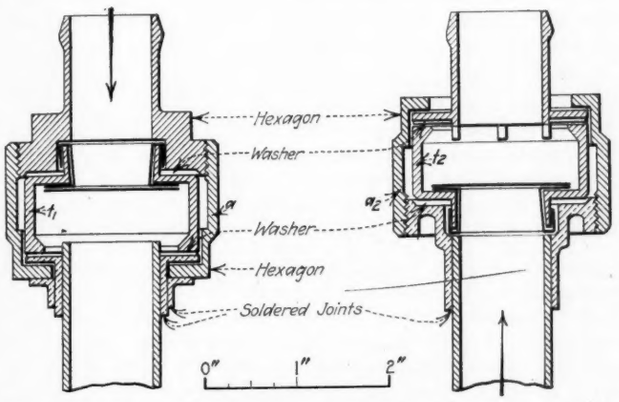


FIG. 8. INSULATION OF PURIFIER



FIGS. 9 AND 10. EXPIRATORY AND INSPIRATORY VALVES

These valves are marked in Fig. 2 V_1 V_2 respectively and placed at the top of the frame denominated F in the same figure. The boxings of the valves are made so as to serve as unions, being tightened by a key. They are so made that connection can be made only in the right way and cannot be made with the valve omitted or with the valve improperly placed.

In many varieties of breathing apparatus it is quite difficult to rid the tubes of saliva. In the present instance the metal portion of the mouthpiece and the saliva trap (see Fig. 12) are made in one, much as in the Tissot apparatus. The saliva trap, being close to the mouthpiece, has the advantage that the wearer can get rid of the saliva at any time by drawing down the conical valve during an exhalation of the breath. An improvement on the French trap is a device that prevents the saliva from passing back to the mouth when the wearer is in certain positions.

Mouthpiece Affords Adequate Air Supply

The rubber portion of the mouthpiece is an important part of any breathing equipment. During my own experience in rescue-station work I have known many cases where the outer flap of the ordinary mouthpiece was too small and also where the teeth lugs have been badly shaped and too thin. To insure a good seal for the mouth the outer flap of the Briggs mouthpiece is of ample size, the lugs are made thicker than is usual and are swelled out and rounded at their extremity. This latter detail is important, for when the lugs are thin and the teeth clenched down on them, the small opening between the teeth offers high resistance to the passage of air when men are working hard and require a large volume. Owing to the nature of mine-rescue work (which is generally performed in a high temperature) the cap adopted is of skeleton pattern. Elastic bands with metal springs in the fabric are employed, so that the cap will fit any size of head. Attached to the cap are cheek plates which by means of hooks carry the nose clip and rubber portion of the mouthpiece. The cheek plates are suspended by bands which are made adjustable for length in order that the mouthpiece may fit closely to the face at all times. A screw nose clip has been adopted in which the metal bridge comes under the nostrils. As the clip is attached to the cheek plates and no part projects from the top of the nose, the clip is not easily displaced by a blow or other mishap.

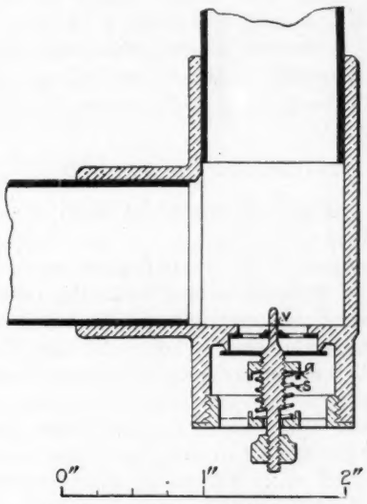


FIG. 11. RELIEF VALVE

This valve is marked R in Fig. 2. Blows off at 4-in. water gage, but can be operated by hand.

Trapped by Fall, Can Live on Reduced Supply

To provide for an emergency such as a team becoming trapped by a fall, the key carried by the leader can be used to adjust the reducing valve so as to give a flow of 0.4 liter of oxygen per minute. This adjustment is made by removing from the valve the adjusting screw and spring controlling the pressure on the diaphragm. With this supply of oxygen the men can rest quietly for many hours until they are extricated. The complete apparatus charged with 3 lb. of caustic-soda granules weighs 29 lb. The apparatus has been subjected to numerous tests, including endurance, climbing and sudden exertion, while special tests also have been carried out involving exhaustion of the purifier. It should be noted that the purifier is regarded as exhausted if it passes more than 2 per cent of carbon dioxide. I have already mentioned that I have taken part in the tests and can justly claim after experience with all kinds of compressed-oxygen apparatus that the

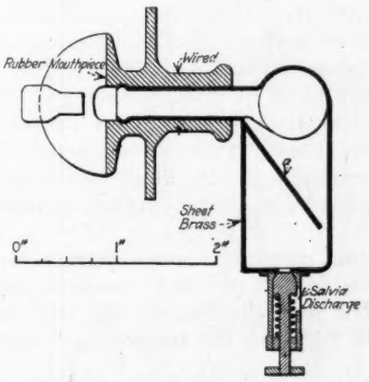


FIG. 12. MOUTHPIECE AND SALIVA TRAP

The sloping diaphragm A collects the saliva and lets it fall into a receptacle from which it cannot return when air is inspired.

Briggs is a big improvement on those in general use.

While wearing the apparatus I was sensible at once of the ample supply of cool air, of the comfort arising from the way in which the load was adjusted and of the freedom of both mind and body. While in its entirety the apparatus is a splendid product of scientific research applied to industrial requirements, the several combining parts testify to the ingenuity, appreciation of essential needs and the skill shown in the direction of the work.

Purifier Eliminates Carbon Dioxide Well

The following are typical of numerous tests conducted on this apparatus:

Endurance Test. Subject H. B. Four pounds caustic soda in purifier. After walking a half hour the temperature rise was 0 deg. F.; after one hour, 11 deg. F.; after 1½ hr., 23 deg. F. and after two hours, 25 deg. F. the carbonic acid at all the four periods mentioned was nil.

The speed of walking was four miles per hour on level ground. The subject then ran 400 yd. at the rate of about five and one-half miles per hour, after which carbon dioxide was found present. The temperature rise was 35 deg. F. The resistance of the whole circuit (mouthpiece to mouthpiece) to a flow of 85 liters per minute was, when measured after the run, only 1.3 in. water gage.

Endurance Test. Subject D. D. The same test repeated, but with a charge of 3 lb. of caustic soda in the purifier. After walking a half hour no carbon dioxide was found and the rise in temperature was 6 deg. F. After walking one hour the carbon dioxide percentage was 0.18 and the rise in temperature 18 deg. F. After a walk of one and one-half hours' duration the percentage of carbon dioxide was 0.41 and the temperature increase 23 deg. F. A walk of two hours' duration brought the carbon dioxide to 0.47 per cent. and raised the temperature to 25 deg. F. After walking for two and one-half hours the percentage of carbon dioxide reached 1.57 per cent and the increased temperature developed was 26 deg. F.

Makes Hard Climb Up Arthur's Seat

Climbing Test. Subject H. B. The test consisted in climbing the hill known as Arthur's Seat in Edinburgh. The climb (involving a vertical rise of 640 ft.) was performed without difficulty in 21 min., the descent to the starting point being made in 9 min. While ascending, the wearer did over 100,000 ft.-lb. of work on an average oxygen consumption of 2.8 liters per min. Owing to a breeze the air in the apparatus proved unusually cool.

On reaching the summit conditions were found to be as follows: Carbon dioxide 0.43 per cent; temperature rise 4 deg. F. On reaching the bottom the carbon dioxide percentage was 0.12 and the temperature rise was 4 deg. F.

Sudden Exertion Test. Subject J. C. In this test no carbon dioxide was found in the inhalation tube. Each trip consisted of a walk of 26 min. duration, a run of 300 yd. followed by a 2-min. walk.

First trip, temperature rise 6 deg. F.; second trip, temperature rise 10 deg. F.; third trip, temperature rise 18 deg. F.; fourth trip, temperature rise 22 deg. F.

Exhaustion Test on Purifier. Subjects D. P and C. R. Four pounds of caustic soda was put in the purifier, and the wearer walked on the level at four miles per hour. The oxygen cylinder was recharged during the test and the intervals of time below do not include the time of recharging the cylinder. The first wearer walked for 1½ hr. and then handed on the apparatus to the second man.

Hours	Carbon Dioxide	Temperature Rise, Deg. F.
½	0.00	4
1	0.00	14
1½	0.00	26
2	0.12	14
2½	0.24	26
3	1.00	36

After walking 3 hr. 6 min. and then running at eight miles per hour for 2 min. the carbon dioxide in the inspired air amounted to 2.24 per cent. The object of this last test was to ascertain the capacity of the purifier and to what extent it will outlast the oxygen supply.

Safety Work in Mines Must Keep Pace with Growth of Coal Industry

THE U. S. Bureau of Mines operates ten mine-rescue railroad cars which travel from mine to mine in the different mining districts of the country, giving training in first-aid and mine-rescue work and assisting in times of mine disasters and fires. In addition the bureau maintains eight fixed mine-rescue stations, seven of which are equipped with auto mine-rescue trucks available in the same manner as the rescue cars.

"This service to the mine and miners has been a real and paying one, accounted only in the number of lives and in the value of property saved," said Director F. G. Cottrell, in a statement Dec. 8. "Its byproducts have been an awakened sense of responsibility of miners and operators alike, resulting in a decided decrease of fatal and non-fatal accidents to miners.

"The movement for safety in the mines is rapidly outgrowing its original position as something quite apart from operating management, and in fact often in conflict with it, to be used only when sentiment dictated; rather, it is proving itself closely interwoven in the economic structure of mining, a part of every drift, every machine and every man's work, and best of all, it is furnishing a common meeting ground and common direction of humanitarian effort for the miner, the operator, the government and the public.

"The mine-rescue and first-aid training work will be continued, with the principle in mind that the bureau organization acts as a teacher and standardizer, not to take the place of self-preparedness and self-help on the part of the individual mine in time of disaster or fire but rather to help organize, encourage and train local men and companies to help themselves. However, that part of our safety work which deals with investigations of safe and dangerous practices, development, use and approval of underground explosives, ventilation methods, mechanical and electrical appliances, and health and working conditions of the miner must grow in proportion to the growth of the industry and the use of more complicated machinery and appliances."

In a speech recently delivered before the American Society of Naval Engineers, Secretary of the Navy Daniels declared: "Has not the time come when oil and coal and water power shall be nationalized? Whether the government shall buy and carry on production of coal, oil and water power, or regulate their production, distribution and price is a question of pressing importance."

Striking miners in the Rhondda coal field district voted Dec. 27 to resume work pending negotiations between their employers and the South Wales Executive Committee. A general strike was reported Dec. 23, following refusal of one company to reinstate eleven dismissed men.

Features That Must Be Borne in Mind in Designing Trucks for Mine Cars

Wheels Fast to Their Axles, Roller Bearings, Exclusion of Grit and Dirt, Provision for Side Thrust and Restriction of All Friction Within a Lubricated Area Are Four Cardinal Considerations To Be Observed in Car Design

By Ira E. Stevens
Pittsburgh, Pa.

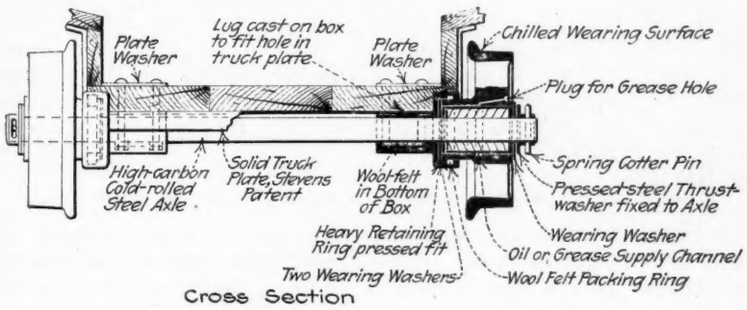
NO ELEMENT entering into the design of mine cars is as important as a proper construction of the truck. To effectively support the car body a truck must be of strong build. It must hold the axles and journal boxes in permanent alignment. It must preserve the wheel gage and form a single unit. The trucks illustrated in this article seek to meet all these several requirements.

The four axle boxes are connected to a heavy steel plate corrugated and flanged at the ends. This construction assures simplicity, rigidity and strength, yet leaves the truck sufficiently flexible to adjust itself to uneven haulage roads. As the plate is a single unit, no unskilled car repairman can appreciably alter the alignment of the axle boxes. This type of truck may be equipped with any style or make of wheels, axles or axle boxes, and may be applied to various shapes of car bodies, old or new.

A self-oiling wheel is used that has positive forced-feed lubrication. Whether a bearing be plain or bushed, fitted with rollers or balls, it should be kept as clean and free as possible from grit and other destructive influences. Grit and dirt will destroy the efficiency and shorten the life of any bearing. Consequently, the self-oiling wheel and axle box are both provided with wool-felt packings, which make them as nearly as can be dustproof. The packing is laid in around the wheel hub, and accurate machining and fitting permit the parts to work with minimum friction.

It must be admitted that the hollow-hub mine-car wheel was an improvement over the old simple type of hub bearing provided merely with an oil hole. It falls short, however, of being more than a step in the right direction. When the wheel is standing still the lubricant settles at one or more points on the axle, but as soon as rotation begins it is thrown by centrifugal force to the periphery of the oil chamber. Lubrication, therefore, ceases, and if the journey be a long one, there is a likelihood that the bearing will be damaged or destroyed.

In the above statement it has been assumed that a fluid lubricant is used. By the use of grease or a heavy oil an attempt has been made to counteract the influence of centrifugal force. The results have not been altogether satisfactory, for the reason that the grease or heavy oil may harden and clog the passages, so that in time the wheel is left without adequate lubrication. It has, therefore, been found advisable to provide a positive method for maintaining an oil circulation through the bearing while the wheel is revolving. In the self-oiling wheel shown in Fig. 3 a specially-designed thrust washer is fixed upon the axle and the wheel is provided with several oil conduits leading from the front end of the hub to a shallow annular chamber adjacent to the axle. An inclosing cap is fitted over the ends of the wheel hub and axle so that a supply of oil or light grease constantly circulates through the bearing while the wheel revolves.



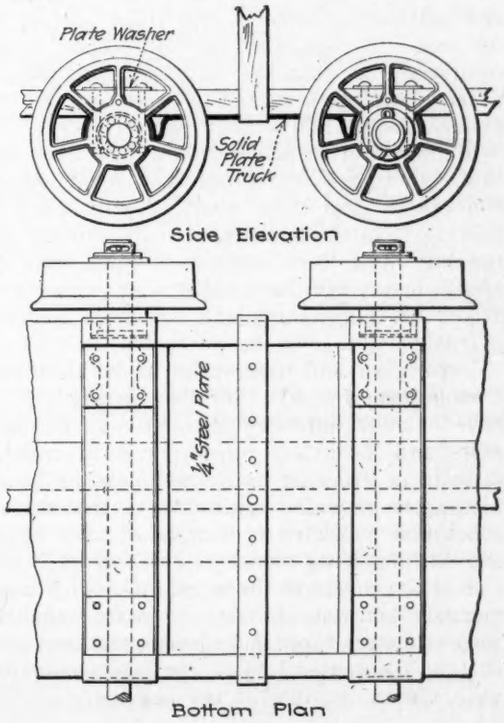


FIG. 1

Solid-Plate Truck with Through Axle

By providing a solid plate corrugated and flanged at the end as the base of the truck, it is made simple, rigid and strong though sufficiently flexible to suit the inequalities in the track. Unless the truck is free from play the stresses to which it is subjected by reason of track irregularities are likely to pull it to pieces.

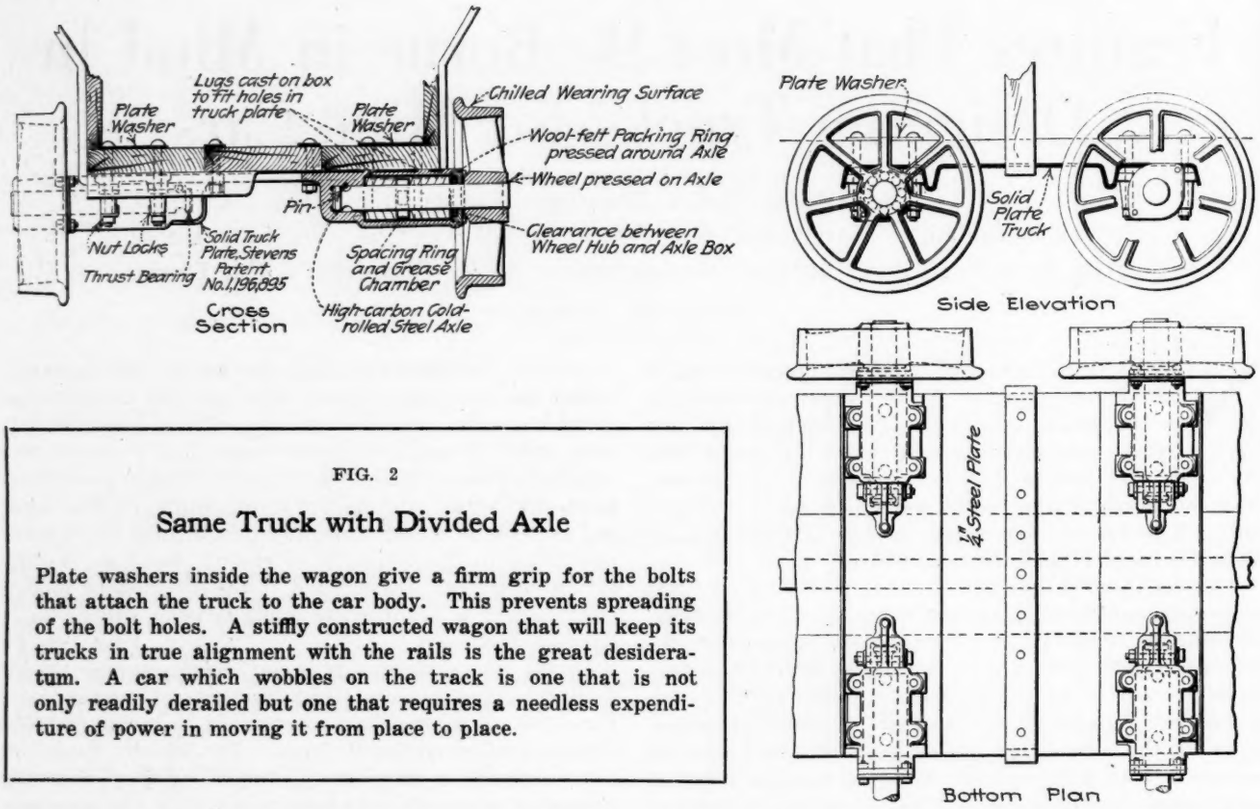


FIG. 2

Same Truck with Divided Axle

Plate washers inside the wagon give a firm grip for the bolts that attach the truck to the car body. This prevents spreading of the bolt holes. A stiffly constructed wagon that will keep its trucks in true alignment with the rails is the great desideratum. A car which wobbles on the track is one that is not only readily derailed but one that requires a needless expenditure of power in moving it from place to place.

Objection often has been made to wheels fitted with caps because cotter pins sometimes wear through, permitting the wheel to come off. This failure of the cotter pin may result in a disastrous wreck or an expensive derailment. It will be observed that in the construction here shown a special force-feed thrust washer in the self-oiling wheel is pinned to the axle, effectively preventing the cotter from being worn or cut off under any circumstances.

Bearing Fails If Boxing Is Not Rightly Made

All that has been said regarding the self-oiling wheel and axle box is true of the roller-bearing wheel and its box. In fact, the only difference between these equipments is that the latter is supplied with roller bearings and such special features as are necessary for easier running and a more perfect type of journal.

Rolling friction is admittedly less than sliding friction. It therefore follows that roller-bearing wheels run easier than those provided with plain or bushed bearings. In the last fifteen years, during which roller bearings have been applied to mine cars, many disappointments have been suffered and many reasons have arisen for questioning the durability of this type of journal.

Experience and observation show that most of the troubles experienced with roller-bearing mine-car wheels have followed improper installations, such as soft-steel axles and hard-steel rollers, or hard rollers working directly in soft cast-iron wheel hubs or boxes with an ineffective provision against the introduction of gritty substances. Many troubles also have resulted from the bearing being too short or from an improper location of the rollers in the wheel hub. This was especially evident when roller bearings were first applied, for they were made too short and in many instances were placed so that the center line of the load would not coincide with the center line of the bearing.

These defects have been remedied in the wheels here illustrated. The roller bearings are properly centered in the hub and are provided with a wearing sleeve and axle of equal hardness. They also are well protected against dirt and grit. All adjacent surfaces in wheels and axles are accurately machined and fitted so that they work together easily and remain in alignment, and the wheels are held on by pressed-steel thrust washers fastened to the axles by cotters that cannot wear off. Several wearing washers are used to reduce the friction of the side thrust. (See Fig. 4.)

Hyatt roller bearings are used because they weigh less than solid rollers, and as they are hollow they provide additional space for lubricant. While these self-oiling wheels will run for several months on one oiling, the roller-bearing wheels will run for six months or more, and it is clear that they possess a lower coefficient of friction.

Crooked Tracks Cause Excessive Thrusts

As mine roads have many curves and are likely to be crooked, car wheels should never turn on their axles, but be fixed to them while the axles themselves revolve in boxes. A number of reasons exist why this principle has not been put into practice. In the first place, the width and shape of mine-car bodies generally have not been suited to outside journal boxes—that is, boxes resembling those used on railroad cars. Track-gage necessities also have prevented the use of tight wheels with inside journals. One tight and one loose wheel have been tried without satisfactory results, for the reason that with inside axle boxes the side thrust caused by track curves and irregularities must be resisted somewhere outside of the lubricated area.

It has been the thrust encountered in rounding curves and in side sway that has caused practically all troubles with mine-car wheels. In the old days when wheels had plain bearings, the bearings wore out faster at one end

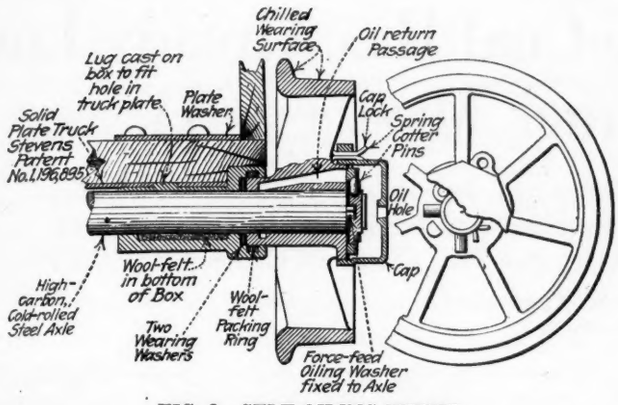


FIG. 3. SELF-OILING WHEEL

A positive feeding system assures regularity in the delivery of oil to the wheel, and careful packing prevents dirt from reaching the bearing surfaces.

than at the other. An attempt was made to cure this trouble by increasing the hub projection—that is, the difference between the line of track gage and the rear end of the wheel hub.

The side thrust produces a direct pressure on the bearing, while the wheel flange in contact with the rail operates as a lever equal in length to half the diameter of the wheel. From this it is easily seen why the bearings in loose wheels wear irregularly or conical. It is this wear that has been so highly destructive. Lengthening the wheel hub was a palliative but not a cure.

Harder Axles and Bearings Are Essential

Another remedy has been to use harder and more substantial material in axles and bearings. Thus roller bearings are made of high-carbon steel, as also are the bearing sleeves and the axles. The principle, however, remains the same and the chief reason that the equipment for roller-bearing wheels is better than its predecessors is that better and more suitable materials are employed and greater care and accuracy are exercised in the processes of manufacture and construction.

Is there a cure for the majority of wheel troubles? Can a wheel and axle box be so designed as to give at all times and under all circumstances the efficiency obtainable from the lowest coefficient of friction and the longest period of service? It is believed that this in large measure can be accomplished. The solid-plate truck makes possible the application of the roller-bearing axle box with independent axle. In this

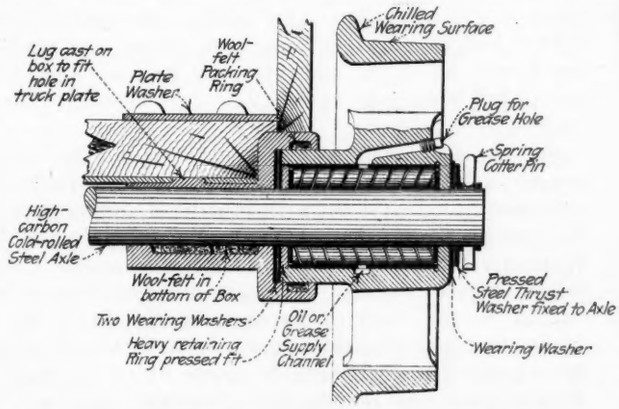


FIG. 4. AXLE BOX WITH ROLLER BEARINGS

A pressed-steel thrust washer pinned to the axle prevents the cotter from being worn or cut off. The axle is made hard and hence the bearing cannot cut into the axle. The center line of the track reaction is the center line of bearing.

equipment the bearings lie entirely within the journal box, the wheel is pressed tightly to place and the short independent axle finds a thrust bearing on its inclosed end, where ample lubrication is available. It is, therefore, clear that as wheel troubles and upkeep expenses have arisen from side thrust, the cure lies in removing this influence from the wheel to some point where it can do no harm. The end of the independent axle inside of the tightly-sealed box receives the thrust, and as this point can be thoroughly lubricated at all times, a difficulty that has been the source of more trouble and expense than any other one detail connected with mine-car operation has been successfully and scientifically overcome. (See Fig. 5.)

Four Principles in Bearing Construction

The following four principles must be kept in mind and applied if best results are to be obtained: (1) Wheels should be fastened to their axles; (2) roller bearings run easier than plain or bushed bearings; (3) the efficiency and durability of roller bearings

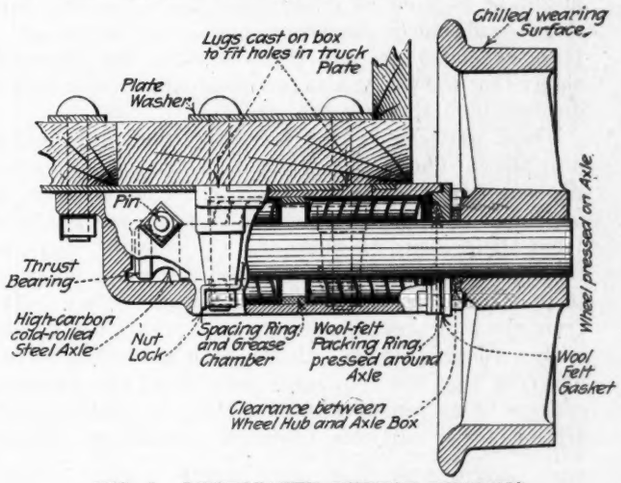


FIG. 5. LUBRICATED THRUST BEARING

Here the thrust as well as the roller bearing receives the benefit of the lubricating grease. This prevents wear. The wheel is pressed onto the axle like a railroad wheel and cannot come off.

depend upon (a) protection from grit and dirt, and (b) freedom from wear incident to side thrust; (4) all friction must be kept within a lubricated area.

The Stevens roller-bearing axle box with independent axle, manufactured by the Fairmont Mining Machinery Co. and illustrated in this article, was designed in conformity with the above principles, and as it will run for a period of at least two years without attention so far as lubrication is concerned its economy in operation is obvious.

Officials of District No. 11, United Mine Workers of America, have been advised of a strike at the Tecumseh mine at Bicknell, where the entire force is idle due to a walkout of the machine operators. The trouble is said to have arisen over a limitation of space alloted the machine men and also to a dispute regarding distribution of cars.

Miners at the Calora Mine No. 2 in the Jasonville field resumed work recently after being idle for several days. The men walked out on strike following some difficulty about shotfiring. The men declared the shotfirer failed on one occasion to explode several shots, and, in consequence, they refused to work.

At the Lens pits during November, the *Colliery Guardian* states, the water level lowered by 23 m. In the No. 5 pit at 35 m., an extensive breach has been discovered in the shaft lining, the work of the German destroyers.

Under the Microscope Coal Has Already Lost Much of Its Former Mystery—IV*

Pyrite Was Formed After Coal Was Deposited, Apparently in Small Crevices—Plant Tissue Is Deflected Around Sand Particles and Resin but Is Discontinuous Where Pyrite Is Found—Conjectures as to the True Chemical Character of Coal

By Reinhardt Thiessen†
Pittsburgh, Pa.

When speaking of the sulphur in coal, it is pyrite that usually is referred to. This appears to the naked eye in the form of balls, lenses, nodules, continuous layers and thin sheets or flakes, which recur in horizontal and in vertical cleavage fissures, and in these forms it for a number of years has received considerable attention. In the hope that it might be possible to eliminate it from the coal before it is used much discussion and experimentation has been expended on it. Unfortunately the microscope shows that the pyrite also occurs as microscopic particles disseminated through the coal.

These particles can be seen only when thin sections are placed under a microscope which gives a high degree of magnification (Fig. 2). When so seen they appear as roughly rounded opaque spots varying in size from about 20 to 50 microns. Occasionally many particles are found to have coalesced into rows or groups, in that case forming larger aggregates. When isolated from the coal they are seen to be more or less globular with a rough surface. Under high magnification it is observed that the roughness consists of the edges and corners of extremely minute cubes. In making a thin section these particles frequently break up into still more minute fragments. At a still higher magnification it will be noticed that these particles are themselves minute cubes.

FIG. 1. VERTICAL SECTION OF YAGGER COAL

At a magnification of 1,000 diameters shows characteristic spore-exines and other details.

Pyrite Clearly Formed After Coal Was Made

The particles of pyrite evidently were formed after the coal had been laid down. Wherever located they seem to take the place of the coal, as if a hole had been eaten out of the mass and filled with pyrite. Any plant structures or striæ are discontinued at the particle and continue on the other side, whereas in the case of sand, resinous or carbonaceous particles the plant structures and striæ are bent over them.

The amount of microscopic pyrite varies considerably in different parts of the same section and in different sections from the same bed, as well as in different beds. Hardly a section is made in which no such particles are found. Some coals like those from the Pittsburgh seam contain relatively few; others, like those from the No. 5 bed near Vandalia, Ind., contain enormous numbers of such particles. Samples taken from the No. 5 bed at La Salle, Ill., also contain large numbers, while those from some parts of the No. 6 bed of Illinois contain relatively few. In other parts again, as at the Middle Fork mine, quite large numbers are present. Microscopic pyrite particles are found in greatest number in the anthraxylon, or bright coal, which is that part of the bed derived from wood (Fig. 2).

Float-and-Sink Separation Our Only Hope

In view of the extremely small size of the pyrite particles and their general dissemination through the coal it seems hopeless to attempt to separate this form of pyrite by means of ordinary washing processes. If the float-and-sink methods ever prove expedient there may be some hope. By taking advantage of their greater specific gravity, those parts of the coal containing pyrite in larger amounts may be separated from parts containing none or relatively few, all other characteristics being equal.

Sulphur also exists in coal in an invisible form called organic sulphur; at least it exists in forms which the eye cannot identify even with the aid of the microscope. It is not known in what combination this sulphur occurs. Wormley, of the Ohio State Geological Survey, first called attention to the fact that sulphur in coal was not all in the form of pyrite, and M'Creath, of the Pennsylvania Geological Survey, showed that there was more sulphur in coal than the pyrite would account for. Kimbal first and Drown later concluded that sulphur must exist in coal as organic sulphur.

Little work has since been done to ascertain the real nature of this form of sulphur. Parr and Powell resumed work on the subject a few years ago, and at

*Fourth installment of article entitled "Recent Developments in the Microscopic Study of Coal," read at the meeting of the Coal Mining Institute of America, Dec. 9, at Pittsburgh, Pa.

†Research chemist, U. S. Bureau of Mines.

present the latter is continuing this work in the U. S. Bureau of Mines, mainly with the object of finding how to eliminate sulphur from gas and coke. That sulphur does exist in coal as indicated is certain, and it is highly probable that, like nitrogen, it forms a part of an organic compound derived directly from the plants from which coal originates. In plant life the nature of sulphur is quite well known.

Microscope Helps Determine Coal Chemistry

The structure of coal has now been worked out quite satisfactorily. From what is known of plant chemistry, it is quite clear what plants have contributed to coal. From a microscopic study of its structure it is now also fairly clearly seen what parts of the plants have remained, but as to the real chemical nature of their remains we can as yet only draw inferences. These inferences, aided by chemical tests, will in the near future enable us to determine the chemical composition of coal.

It has been made clear that the largest part of the dry matter of plants as a whole consists of ligno-cellulose and cellulose, and so coal is derived principally from those substances. Unfortunately, we know too little about the decomposition products of these compounds. In natural peat all the matter which by its structure and nature is shown to be of woody origin consists no longer of cellulose, ligno-cellulose or lignin. What that matter is has not yet been determined.

In coal we are still farther away from the answer, and yet if the coals were derived solely from the woody matter of plants, its study would be relatively easy. Many other plant products enter into its composition, and although on the whole these form by far the smaller proportion of the whole coal, yet they serve to make more difficult the study of its composition.

Celluloses Mixed with Many Other Compounds

A large number of plant products besides cellulose are present in modern plant life and in all probability were constituents of the plants of the Carboniferous age. The chemistry of these in the living plant, however, is much better known than that of the celluloses. Some of the more important are proteins, resins, waxes, fats, oils, starch, sugars, gums, alcohols, tannins, glucosides, terpenes, camphors, phytosterines and alkaloids. While some of these are present in the plants in only small proportions, like the glucosides, phytosterenes and others, a number, like the resins, fats and waxes, are found in considerable quantities.

Many plant products occur in small quantities, but whenever they belong to the aromatic or ring compounds and their derivatives they are of great significance. Hydrocarbon compounds that contain either a single or compound benzol ring are quite stable. Oxidizing reagents, for example, will not attack the benzol ring, but any hydrocarbon of the paraffin group which is attached to that ring, as an end group or side chain, is readily changed or removed.

Compounds with a group of closed rings, that is, compounds with the naphthalene, anthracene or phenanthrene nucleus and their derivatives, behave in like manner. These compounds are waste products of plant assimilation—that is, they are not foodstuffs—and are thrown off or deposited in certain parts of the tissues. Because they are not foodstuffs they are not usually attacked by organisms like bacteria.

For this reason many of the plant products that occur in but small quantities in plants, like benzols, phenols, chinones, aromatic alcohols, ketones and aldehydes and their derivatives, terpenes, camphors and phytosterines, alkaloids and others that may have remained in the coal-forming débris, may have been accumulated or concentrated (as we have seen that the resins have been) and thus are found in considerable quantities in coal, as is clearly revealed when coal is distilled.

Microchemical Tests Reveal Ring Compounds

In peat the presence of many of the ring compounds found in plants may be shown by means of microchemical tests. In the lignites some of these compounds can still be detected. In bituminous coals, however, none can be revealed by such means, but when coal is subjected to distillation, many of those compounds or their derivatives appear in the distillates.

During the whole process of the transformation of plant substances into coal there is a gradual loss of oxygen. More correctly, there was a loss also of carbon and hydrogen, but relatively the oxygen suffered a greater loss than the other two elements. This is what geologists call deoxygenation. What other changes have taken place in the organic compounds besides the loss of oxygen is not exactly known. It may be polymerization, dehydrogenation, or both. It is certain that in some cases dehydrogenation takes place.

An example is found in retene, a fossil resin found in peat, lignite and in fossil conifers. It is a hydrocarbon having three rings with only one hydrogen atom attached to each free-carbon atom. It may be derived by distillation from the two constituents of resin—abietinic acid and pimaric acid—as has been shown by Vesterberg and Tschirch, and it is, therefore, related to these. But abietinic and pimaric acid have two hydrogen atoms attached to each free-carbon atom instead of one.

There has been not only a removal of the oxygen but also a removal of one of each of the two hydrogen atoms attached to the carbon atoms in the change from the resin acids to retene. Chemists call this dehydrogenation. Fichtelite is another fossil resin, also found in peat, lignite and fossil wood and sometimes associated with retene, and it also is supposed to be derived from either abietinic or pimaric acid. But in this case each side group containing oxygen has been replaced by two hydrogen atoms, and in every place where retene has one hydrogen atom attached to a carbon atom, fichtelite has two. Fichtelite is among the most stable organic compounds known. Amber and succinite also are fossil resins with a similar history. Those examples are given to convey an idea as to what in all probability has happened to the many well-known compounds which are contained in plants.

What was said concerning the aromatic or ring compounds and their derivatives is true also to some extent of the aliphatic or chain compounds and the compounds derived from them, although these are not as stable as the ring compounds. It should be emphasized that the aliphatic compounds constitute by far the largest part of the plant substance. The cellulose, gums, oils, fats, starch, alcohols, proteins, sugars and acids belong in that classification.

Their radical or nucleus is a paraffin chain to which are attached various end groups containing oxygen, that make them what they are. Some of the plant substances, like starch, sugar and protein, may decompose

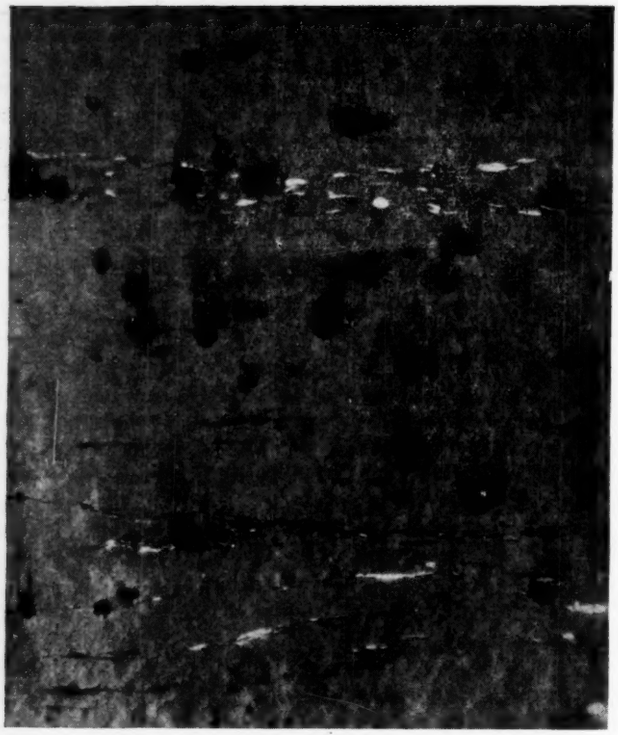


FIG. 2. BRIGHT COAL FROM MIDDLE FORK, ILL.
This thin cross-section clearly shows the finely disseminated pyrite particles in the No. 6 bed of Illinois. The magnification is 200 diameters. It will be noted how grinding has smudged the pyrite crystals into crystals of still finer size.

readily, but not without leaving some of the decomposition products behind. Others, like fats, waxes and cellulose, are relatively stable. Their end groups—that is, that group that makes a fatty acid or an alcohol, or whatever it is, out of a paraffin—are more easily removed and a paraffin remains.

Fats Less Permanent Than Ring Compounds

Supposing the root stocks of one of the coal-forming plants had contained in a part of its tissue 20 per cent

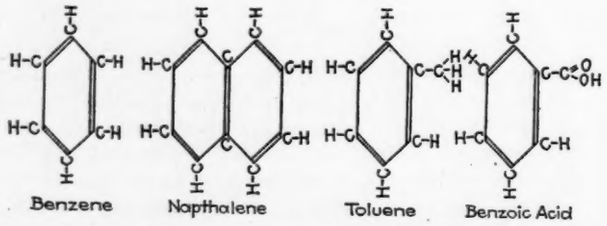


FIG. 3. BENZENE RING AND DERIVATIVES.
Benzene, C_6H_6, a single ring; naphthalene, $C_{10}H_8$, a double ring; toluene, $C_6H_5CH_3$, benzene ring with side chain; benzoic aid, $C_6H_5CO_2H$, ring the same with the side chain oxidized.

of fat, consisting of palm and Japan oils, as in one of the living plants of today; those oils would split into their respective fatty acids and glycerin. During the coal-forming period, the fatty acids, as well as the glycerin, would, to some extent at least, be deprived of the end groups containing the oxygen, and two corresponding paraffins would be formed. It is a well-known fact, as already stated, that the coal-forming process is accompanied by the loss of oxygen.

All plants contain more or less fats and oils, ranging from a fraction of 1 per cent to as much as 75 per cent in certain parts of the plant. There is hardly a living plant cell that has no fat or oil in it, but it is more concentrated in certain tissues, as seeds, fruits and roots. In the peats some of the fats and oils may still be detected.

In the lignites also they may yet be discovered, although with difficulty on account of their changed nature. In the coals neither the fats nor the oils are recognized as such by the microscope except in the spores and cuticles which yield oil. But we cannot imagine for a minute that they have been lost completely

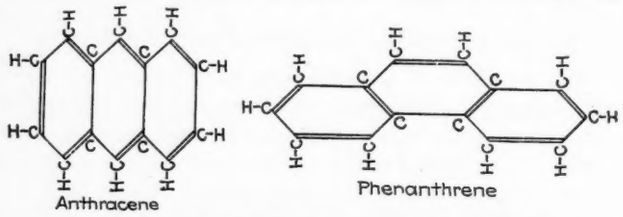


FIG. 4. ANTHRACENE AND PHENANTHRENE
Anthracene is represented by three benzol rings. Its formula is $C_{14}H_{10}$. The ring compound which represents phenanthrene is different but the formula is still $C_{14}H_{10}$.

in coal, and aside from spores they should be present either as oils or as "kerogens"—that is, oil-yielding substances.

The leaves, young stems, petioles, fruits and often older stems are covered with a protective layer called cuticle. This covering is composed of oils and waxes as is also the outer covering of spores and pollen grains, which, as has been said, are characteristic constituents of peat, lignites, oil shales, coal and especially cannel coal. In Europe there are certain deposits, known as pyropissite,* that are of great value by reason of the oils and waxes that may be distilled from them. These deposits consist largely of spore matter, which is the source of the large quantities of oil and wax which

FIG. 5. ILLINOIS OIL SHALE
Thin cross-section magnified 1,000 diameters. This section was taken from a place just below the big spore-exine shown in Fig. 11 of the second installment. It shows that the organic matter of the mass between the large spore-exines also is largely composed of spore matter. The black areas represent pyrite particles.

*Friable coaly substance which forms a layer 6 to 9 in. thick on brown coal at Weissenfels, near Hallé. On distillation it affords 62 per cent of paraffin—Dana's "A System of Mineralogy."

they contain. We have not developed such industries in this country, although deposits consisting largely of spore matter are known. One at Lester, Ark., has been utilized in a crude way for the distillation of oil and a relatively large yield has been obtained. The cannel coals were quite extensively used for the same purpose before petroleum was discovered in the rock. Today, when the oil wells are waning, attention is again being turned to the oil shales. Owing to the spore matter of which the organic material is largely composed they promise an almost inexhaustible supply of oil.

Schedule-Rating Rules as Applied to Distance of Timber from Face

ON DEC. 16 the coal-mine section of the Pennsylvania Compensation Rating and Inspection Bureau held a hearing to determine, if possible, whether it would be practicable to change the distance between the last row of props and the working face from 6 ft., as at present, to 3 ft. Under the arrangement proposed the props would, before shooting, be set 3 ft. from the face. Dr. Downey, who presided at the meeting, addressed the fifty or so mining men present, calling particular attention to the fact that half the total accident loss comes from falls of roof, mostly at the face and between the last set of timbers and the coal.

In the four-year period 1916-1919 there were 879 fatal accidents from this cause and 490 happened while the men killed were mining or loading coal. In drilling the coal 21 men were killed, 24 men were fatally injured when going back to inspect the result of their shots, 18 were killed while testing roof, 69 when setting and 75 when pulling props. While pulling down slate 28 were killed, 11 lost their lives when working on tracks, 14 while traveling on roadways and 127 in ways not specified. Two were killed by falling props. Besides this, 97 men were killed by falls of coal. Of the total number of men killed 323 lost their lives on pillar work, 507 in rooms, and 144 on entries.

Seeks Greater Safety for Workers

The doctor thought that some method of timbering might be devised whereby the deaths from this source could be materially decreased, and the desire to find out if this were possible led him to call the hearing. He pointed out that practically every operation connected with the actual mining of the coal is done under the roof which stretches between the face and the last set of timbers and that according to the present standards this distance was 12 ft. By decreasing this distance to 9 ft. he thought that the safety of the men would be enhanced, but he desired to find out if the idea was practicable.

A couple of months before the meeting was called the Compensation Bureau had appointed two committees to make actual tests in the field to see what effect on the mining a closer placing of the props to the face would actually have. From these tests results were obtained that showed that props set 3 ft. from the face would continue to stand despite the shooting of the coal and that wherever the props were shot down, black powder had been used.

It was further shown that with the props placed 3 ft. from the face before shooting, sufficient space was allowed for the sumping of a shortwall machine, but there was not sufficient room to use a breast machine unless the props were removed. Dr. Downey did not think that this was of importance, as he stated that there were only a comparatively few breast machines in use. It was shown, however, that in 1919 there were more than 1,448 and in 1920 more than 1,496. Approximately 25 per cent of all the machines in the state are breast machines. With a 3-ft. clearance there also would be insufficient room for the operation of arcwall and straight-face machines.

It was shown that the timbers set by the committee were set tight to prevent their being dislodged. This, however, is bad practice, for a timber should be placed in position so loosely that when the weight comes upon it, it will not snap as it will when it has been wedged tightly into place.

The mining officials declared in their turn that with props so near the face, the men, being compelled to work in close quarters, would be likely to be killed if the coal started to roll. They declared that the records obtained by the Compensation Board were not complete enough to fully determine the actual causes of accidents. The fatalities might be caused by actual roof falls or by falls of draw slate or by the rolling of coal or by some combination of these occurrences, and they felt that the board ought to make such an investigation of these causes as would determine exactly what they were and that upon that knowledge they should fix their standards.

At a meeting of the committee after the hearing was finished it was decided to postpone action on this suggested standard and to try the old one for another year and meanwhile obtain better data, so that more exact action could be taken. At the same meeting some minor changes in the electrical standards at mines were adopted.

IN ITS ANNUAL REPORT the Bureau of Standards says its mine-scale investigation has been delayed due to resignation of scientific men and the necessity of training new men for the work. The bituminous coal strike also curtailed the work. A total of 221 mine scales were investigated, 72 being found to be within the allowed tolerance, which is 0.4 per cent. The Bureau says that conditions under which mine scales are installed and operated are unfavorable to continued accuracy, but that no injustice results by allowing the tolerance. Where scales were found accurate, distrust and suspicion were allayed in the minds of the workers and operation continued with better feeling on both sides. Where scales were found inaccurate, corrective measures were applied and both parties were satisfied. The mine scales investigations were in new mining regions in the bituminous fields of Kentucky, Tennessee, Ohio, West Virginia and Georgia.

ESTIMATES OF THE LIGHTHOUSE SERVICE of the Department of Commerce submitted to Congress include 50,000 tons of bituminous coal and 9,000 tons of anthracite.

CLOSING OF THE Soo locks Monday, Dec. 27, officially marked the close of the 1920 navigation season in the Upper Great Lakes. It was the latest closing in the history of the Soo Canals.

MORE THAN six and a quarter million dollars will be required to pay the fuel bill—coal and oil—for the various city departments of Greater New York in 1921, according to the budget adopted by the Board of Aldermen. Of this amount the Board of Education will require $1,738,548.87 to pay for heating the various school buildings and the other buildings controlled by it, while the Department of Plant and Structures will require $1,033,877 to pay its fuel bills.

Engineers Afforded Latest Information on Powdered Coal and Briquets

Results of Pulverized-Coal Tests at Lykens Colliery—Low Carbon Dioxide Not Inconsistent with Efficiency—Anthracite Dust in Streams Is a Total Loss—Briquetting Anthracite Fines—Bethlehem Steel Has for Years Used Pulverized Coal to Advantage

By R. Dawson Hall
New York City

SOME of the interesting discussions which closed the meeting of the Engineers Club of Philadelphia, the early part of which was reported in *Coal Age* Dec. 23, 1920, on pages 1280-1282, are worthy of publication as they represent the latest advances in the arts to which they make reference.

I. R. Wyllie, of the M. A. Hanna Co., stated that in his experiments with pulverized coal under boilers at Lykens Colliery he got the highest efficiency with 10 to 11 per cent of carbon dioxide in the stack gases. When 14 to 17 per cent of carbon dioxide was obtained he could not get such a high rating from the boilers as he did with lower percentages of dioxide. The greater efficiency with the use of larger quantities of air was contrary to theory but seemed to be proved in actual practice. The larger quantity of air admitted decreased the heat of the fire but apparently that was compensated by the greater velocity of the gases. Mr. Wyllie passed around the interesting table which is included in this article and which will be found on the following page.

Mr. Savage, of the Combustion Engineering Co., said that powdered anthracite coal was not suited to low ratings and intermittent loads. He said that high efficiencies could be obtained but not high boiler ratings.

R. H. Vail on being asked what sizes of material usually were fed to fine grinding mills replied that it was usual in the West to reduce the material to from ¼ in. to ⅜ in. before putting it through the final stages. Asked by William Griffith, of Scranton, whether a better result would be obtained if material running between $\frac{1}{16}$ and $\frac{1}{32}$ in. before final pulverization were used, Mr. Vail said that it would. Mr. Griffith presented fine material obtained by collecting dirty water from a stream flow in the anthracite region. He said that he believed that there were prodigious quantities of coal in the rivers of the anthracite regions and that the coal the dredging companies were trying to save was barely one-twentieth of the whole quantity of coal that the rivers were conveying.

Briquetting with Starch and Asphaltum

J. H. Kennedy spoke on the briquetting of anthracite. He said that the briquets must be waterproof and hard but they must not be so hard as to be brittle. They must also not melt down in the fire. This company was using the C. E. Hite process, the binder used in which was composed of one part of starch, twelve parts of water and two parts of asphaltum. The starch was mixed in cold water because with hot water it will become lumpy. The mixture is added to boiling water.

The binder is 8 per cent of the mixture, the other 92 per cent being culm. The briquets, or boulets, are made on a Belgian press. The briquet when made is soft; to get a hard briquet the water must be taken out and this must be done carefully. It would not do to harden the outside of the briquet, making the steam generated within break its way to the surface as the heating continued, thus disrupting the briquet. The briquet is passed through a tube 100 ft. long and 8 ft. in diameter. The first compartment is heated to 210 deg. F. and the second to 350 to 400 deg.

This latter temperature dextrinizes the starch and hardens the briquet, but care must be taken not to heat the briquet to a higher temperature, as the starch is likely to carbonize at 450 deg. F. and the briquet will then be brittle. After that the briquets are allowed to harden for a while at atmospheric temperature. In burning such briquets clinkers rarely form. It is necessary to use less draft in burning them than when burning anthracite coal. The briquets weigh 2½ oz. each.

The culm used is that from the Lykens Valley, which is low in ash. The only preparation is drying and screening. The coal is not washed. An analysis shows: Moisture, 1.17 per cent; volatile matter, 13.38 per cent; fixed carbon, 75.29 per cent; ash, 10.16 per cent; sulphur, 0.64 per cent. Calorimetric tests show a heating capacity of 14,090 B.t.u.

No Trouble Till Anthracite Is Pulverized

W. W. Pettebone, of the Bethlehem Steel Co., said that his company had been using pulverized bituminous coal for fifteen or sixteen years, it being a pioneer in the use of this form of fuel. Fuller mills were used and they had given unfailing satisfaction. In March, 1920, an attempt was made to change over from bituminous to anthracite river coal and in ten days the Fuller mills had broken down, though no trouble had been experienced in operating with bituminous coal.

Properly pulverized anthracite can be burned very successfully. His experience with bituminous coal showed that when too much speed is used in pulverization oversize may be formed. This may be burned by turning compressed air on the fallen material, which raises it into the flame under the boiler. It is, however, possible to use too much compressed air, in which case there is a burst of flame which almost amounts to an explosion.

He found that he obtained a monthly efficiency of 80 per cent, but in figuring this he deducted nothing for the use of air in the fan, which, of course, reduced the net efficiency. In obtaining a steam production considerably over the rating of the boiler there was a risk of burning out the furnace. He could not say what excess boiler rating it would be safe to seek in the burning of pulverized anthracite.

Results of Boiler Trials Made at Pulverized Fuel Plant, Lykens, Pa.

TYPE OF BOILER: B. & W. INCLINED HEADER, 3 PASS, 7 HIGH x 16 WIDE

Date of trial		Feb. 21	Feb. 23	Feb. 28	Mar. 4	Mar. 5	Mar. 12	Mar. 13	Apr. 8	Apr. 29	Aug. 4	Apr. 23
1 Number of boilers tested		1	1	1	1	1	1	1	1	1	1	1
2 Duration of trial	Hr.	5	5	3	2.75	4	8.83	3.417	4.95	4.28	5.88	6.20
Dimensions and Proportions:												
3 T tal water heating surface per boiler	Sq.ft.	2,357	2,357	2,347	2,357	2,357	2,357	2,357	2,357	2,357	2,357	2,357
5 Kind of furnace (Hanna)	.....	No. 3	No. 3	No. 3	No. 3	No. 3	No. 3	No. 3	No. 4	No. 4	No. 4	No. 4
11 Height of stack above dead plate	Ft.	64	64	64	64	64	64	64	64	64	64	64
12 Size of stack (diameter)	.....	5 ft.	5 ft.	5 ft.	5 ft.	5 ft.	5 ft.	5 ft.	5 ft.	5 ft.	5 ft.	5 ft.
Pressures:												
13 Steam pressure in boiler by gage	Lb.	118.7	119.8	120.9	117.6	117.0	115.7	117.0	117.2	112.4	107.1	116.6
14 Draft in flue behind boiler	In.	0.456	0.415	0.398	0.378	0.371	0.365	0.374	0.362	0.388	0.350	0.329
15 Draft in furnace at bottom	In.	0.161	0.184	0.163	0.156	0.148	0.212	0.178	0.201	0.172	0.154	0.196
16 Draft in furnace at top	In.	0.040	0.050	0.041	0.028	0.028	0.044	0.041	0.050	0.048	0.033	0.054
17 Draft in boiler at top 1st pass	In.	0.037	0.046	0.053	0.032	0.032	0.087	0.061	0.054	0.036	0.021	0.049
18 Draft in boiler at bottom 2nd pass	In.	0.108	0.099	0.144	0.108	0.129	0.158	0.143	0.130	0.104	0.085	0.111
19 Draft in boiler at top 3rd pass	In.	0.161	0.151	0.240	0.147	0.202	0.201	0.204	0.144	0.124	0.096	0.116
22 Blast at riser on pipe	In.	1.70	1.495	2.20	1.84	2.06	2.025	3.775	2.60	2.02	2.29	1.71
Temperature :												
31 Of feed water entering boiler	Deg.	193	192	195	189	190	194.5	195.6	194	192	197	194
32 Of escaping gases	Deg.	625	620	627	633	633	676	825	627	617	630	562
Fuel:												
34 Kind of fuel (pulverized)		Lykens slush	Lykens slush	Lykens slush	Lykens slush	Lykens slush	Lykens slush	Lykens slush	Lykens slush	Lykens slush	Lyk. Seam Dirt	Lyk. No. 2&3 Bwt.	Coke Braise
35 Moisture	Per cent	0.60	0.50	0.57	0.45	0.35	0.60	0.51	0.78	0.60	1.25	0.99	
36 Volatile matter	Per cent	8.33	8.55	8.31	8.56	8.52	8.65	9.34	8.67	8.09	8.55	9.89	
37 Fixed carbon	Per cent	77.80	79.35	77.65	78.78	79.73	78.27	77.70	79.60	80.11	78.30	73.76	
38 Ash	Per cent	13.27	11.10	13.47	12.21	11.40	12.48	12.45	10.95	11.20	11.90	15.36	
40 Calorific value per lb., dry	B.t.u.	13,120	13,426	13,124	13,170	13,310	13,194	13,302	13,509	13,407	13,289	12,190	
41 Weigh of fuel a fi ed,	l b.	5,492	5 084	5,208	3 550	5,003	18,837	8,254	8,105	3,963	6,564	6,918	
42 Weight of dry fuel	Lb.	5,459	5,059	5,248	3,534	4,985	13,754	8 212	6,117	3,939	6,482	6,850	
Size of Fuel:												
46 Through 100 mesh	Per cent	96.42	93.94	95.00	93.00	94.00	96.80	97.00	96.00	97.90	99.36	98.30	
47 Through 200 mesh	Per cent	86.73	79.80	82.50	77.80	79.50	84.43	85.70	85.80	89.50	90.68	92.60	
Calorimetric Data:												
50 Quality of steam (dry steam equals 1.00)	.....	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
51 Factor of evaporation		1.062	1.063	1.060	1.065	1.065	1.060	1.059	1.061	1.062	1.056	1.060	
Water:												
52 Water dumped to boiler	Lb.	53,970	46,277	39,863	28,150	41,634	112,566	63,616	60,532	40,863	67,848	61,303	
53 Equivalent evaporation into dry steam from and at 212 deg. F	Lb.	57,316	49,192	42,255	29,980	44,340	119,320	67,369	64,224	43,396	71,647	64,981	
54 Equivalent evaporation into dry steam from and at 212 deg. F. per hr	Lb.	11,463	9,838	14,085	10,902	11,085	13,513	19,716	12,975	10,139	12,185	10,481	
Horsepower:												
55 On basis of 34.5 lb. evaporation per hour from and at 212 deg. F	Hp.	332.3	297	408	316	231.3	391.7	57.15	376	293.9	353.2	303.9	
56 Builder's rating	Hp.	250	250	250	250	250	250	250	250	250	250	250	
57 Per cent of rating developed	.....	133	114.7	163	126	128.5	156.7	228.6	150.4	117.6	141.3	121.6	
Economic Results:												
58 Water pumped to boiler per lb. of fuel as fired	Lb.	9.83	9.10	7.55	7.93	8.32	8.14	7.71	9.82	10.31	10.33	8.86	
59 Equivalent evaporation per lb. of dry fuel	Lb.	10.5	9.72	8.05	8.48	8.89	8.67	8.20	10.49	11.02	11.05	9.49	
60 Total heat absorbed per lb. of dry fuel	B.t.u.	10,189	9,432	7,812	8,229	8,627	8,413	7,960	10,180	10,694	10,723	9,209	
61 Combined efficiency of furnace and boiler	Per cent	77.7	70.2	59.5	62.5	64.8	63.8	59.9	75.3	79.7	80.7	75.5	
Rates of Evaporation and Combustion:												
62 Equivalent evaporation per sq.ft. of water heating surface	Lb.	4.86	4.17	5.93	4.62	4.70	5.73	8.36	5.50	4.34	5.17	4.44	
66 Dry fuel burned r er hp. per hour	Lb.	3.27	3.55	4.28	4.07	3.88	3.98	4.21	.....	3.13	3.12	3.53	
Analysis of Gases Top 1st Pass												
67 Carbon dioxide	.....	14.0	9.50	12.4	10.0	11.7	17.3	18.2	12.4	10.8	10.0	11.96	

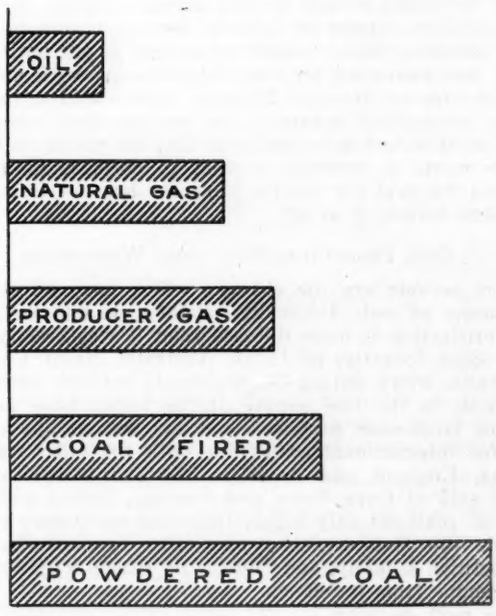
NOTE.—Item 41 was taken from revolutions of screw conveyor and is not considered to be very reliable.

Future of Oil as Boiler Fuel is Doubtful Even in Stationary Service

IN A paper on "Burning Coal at 100-Per Cent B.t.u. Efficiency" read at the Fuel-Economy Symposium held in New York, Sept. 21, 1920, W. O. Rendel exhibited a chart demonstrating the relative number of British thermal units that can be purchased for a cent at present fuel prices. It will be noted, however, that, in Mr. Rendel's opinion, coal, whole and powdered, distances its old opponents producer gas, natural gas and oil.

Powdered coal leads the procession as the latest and best form of fuel. Oil has its advantages in marine service, because it is readily loaded and can be stowed in inaccessible corners, but, on the whole, powdered coal may, even in this particular, be made equally available and with its greater efficiency be found of equal or greater service.

Mr. Rendel mentioned that in one plant the fuel consumption per ton of material produced was reduced from 244 lb. hand-fired to 60 lb. with powdered coal as fuel. Yet a coal of much poorer grade was used for the powdered material than was furnished for hand-firing. At another plant the reduction was from 440 lb. stoker-fired to 185 lb. when the firing was with powdered coal. A new era in steam generation is on its way, and it would seem that coal men should prepare for it by supplying the market with the new size—impalpable dust.



RELATIVE THERMAL EFFICIENCY FOR ONE CENT AT PRESENT PRICES

Unmanufactured coal properly fired had no successful rival for boiler use till powdered coal appeared. Now that the value of coal dust is established the coal operator should see that the business of manufacturing it does not escape him.

Why the Export Coal Business of America Should Be Built Up—III

British Good Will, Gained Through Long Pre-eminence in the Trade, a Handicap to Newcomer—English Financial Control Shaken by the War—America Has Large Reserves, Rich Seams, Machine Production and Low Costs Per Ton

By Erich W. Zimmermann, Ph.D.*

IN THE preceding installment was shown what coal exports have meant to Great Britain. There now remains the task of demonstrating in what way and to what extent the British lesson may be applied to our own conditions. It should be understood from the outset that coal exports can never again mean to any country quite as much as they meant to England around the beginning of the twentieth century. At that time there hardly was a portion of the globe where British coal could not be found. But since then important changes have occurred. World supply and world demand of coal have been almost revolutionized.

To take up the question of the demand first, ship construction and ship operation have been altered so as to reduce the value of coal exports to shipping as ballast cargo. In the days when ships had to buy sand or stone or similar material to serve as ballast and then had to rent lots upon which to dump their ballast, a cargo of coal was worth a good deal more than today, when the double bottom, allowing the use of water ballast, has done away with this practice.

Then the increasing use of fuel oil for ship propulsion has—at least relatively speaking—reduced the importance of coal exports for the merchant marines of the world. Only a few years ago practically all merchant steamers plowing the seven seas depended on coal and a considerable portion of the coal exported from Great Britain was destined to the numerous coaling stations that dot the sea lanes of the world. There it was sold to the steamers which called to replenish their bunker supply. Today, according to a recent statement of Admiral Benson, chairman of the U. S. Shipping Board, about 75 per cent of our entire merchant fleet burns oil for fuel, as compared with about 15 per cent for all foreign shipping. This rapid advance of oil as marine fuel naturally has cut into the demand for coal, but it should be remembered that the merchant marine of the world is growing, so that in absolute figures the demand for coal for marine purposes has not lessened to the same extent, if at all.

Coal Production Now More Widespread

More serious are the changes which have affected the production of coal. Generally speaking, we may say, world coal production is more diffused than it was twenty years ago. Such countries as Japan, Australia, Natal, Chile and Australia, which during the nineteenth century contributed but little to the fuel supply of the world, have not only become large-scale producers but are successfully competing for international coal trade with the older coal producers, England and America. Instead of British coal being sold at Cape Town and Bombay, Indian and South African coals not only supply their own territories but even invade the Mediterranean market.† England feels this competition severely, and there is no reason why we should be immune from its effects.

The next question is: To what extent can the United States compete with England for these restricted overseas markets? Do we enjoy the same advantages as Great Britain in regard to the exportation of coal? The remarkably favorable position of Great Britain was well described in a French official report on the position of the coal trade in 1859 as follows:

> England is the most favored country in Europe in the extent and richness of its coal fields. Its superiority is confirmed by the varied and generally excellent quality of its coal, and by the regularity of its strata, which are very favorable to the working of the coal mines. Lastly, as if nature had striven to unite in these coal fields all the circumstances most favorable to mining and trading in coal, the two richest basins—those of Wales and Newcastle—are intersected by the sea. The coal owners can load and ship their product in the most economical manner, and then assign them to any point of the home or Continental coasts. Oversea conveyance, too, is the cheaper because in English commerce the outward voyage may be considered as a voyage in ballast, and the return freight covers the chief part of the expense. A like union of favorable circumstances does not present itself at any other part of the globe—a natural privilege with which no other country can entertain the notion of contending in regard to industry formed upon the working and trading in coal. Any attempt at competition of the kind would necessarily be followed by defeat.

America's Trade Opportunity in Coal

The quotation is interesting both because of those features which still hold true today and those which have altered. The American counterpart to this eulogy of the British coal export situation may be found in the Federal Trade Commission's report on co-operation in American export trade. Here we read:

> Coal is one of the most promising commodities for the future development of a heavy export trade from the United States. This country has the greatest deposits of coal of any in the world. Its reserves are estimated to be greater than those of all other nations combined. It has an abundance of coals of especially fine quality for all the uses to which this mineral is put, from household purposes to the most exacting metallurgical and steam demands. Immense producing fields are near enough to tidewater to facilitate export business. Suitable coal-handling equipment is already in use at many ports. The production of coal has been developed on a larger scale with a greater use of mechanical equipment and at a lower average cost per ton than in any of the important European coal-producing countries.

England's advantages as a coal exporter may be summed up as follows:

(1) High quality steam coal, particularly Welsh coals coming from mines on the Admiralty list; (2) proximity of coal fields to tidewater; (3) proximity to the European market; (4) control of transportation, storing, docking and distributing facilities throughout the world; (5) long experience in international coal trade; (6) established good will; (7) financial control over foreign coal consumers (*e.g.*, Argentinian or Egyptian railroads); (8) world leadership in shipping; (9) heavy bulk imports and almost complete lack of heavy bulk exports other than coal.

On the other hand, our advantages are:

(1) Large reserves; (2) richer seams (more regular strata); (3) machine production; (4) proximity to Caribbean and South American market (southern section of the east coast of South America excepted); (5) lower cost of production.

On the face of it, it seems as if the United Kingdom held the trump cards, but further study renders this conclusion problematic. At any rate, one fact is certain, namely, that our

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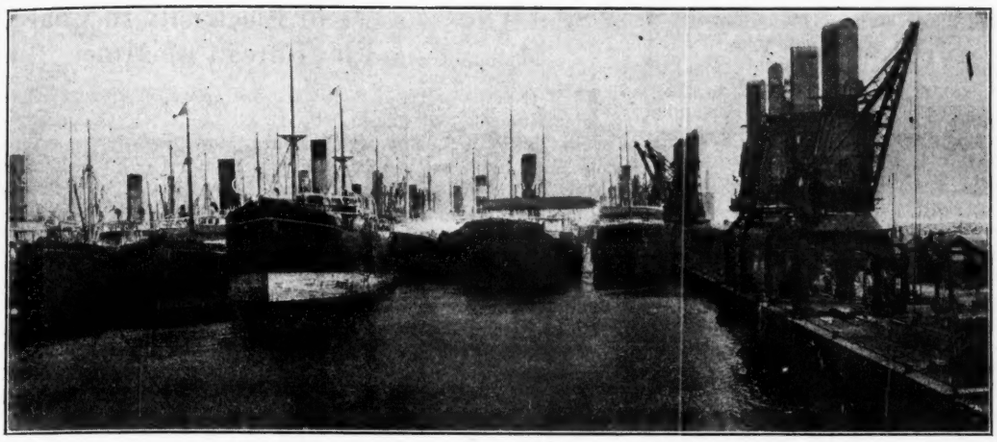
*Professor of commerce, the James Millikin University, Decatur, Ill.

†A recent press dispatch reported a cargo of Chinese coal for Newcastle, England—"carrying coals to Newcastle"!



A Coal Dock at Cardiff

A large number of tramp steamers dock at and clear from the Welsh coal port, the craft depicted herewith being of that class. On the pier at the right are shown a number of coal loaders.

advantages tend to become more pronounced, while those of the United Kingdom are losing significance. Of course, the quality of Welsh coal can scarcely be said to change, but the reputation of Welsh coal is today no longer quite as formidable as it used to be. For a time it was reputed to be the best coal in the world. Today much of that splendor has paled, and other coals rank equal with the best Admiralty coal. Nor is the proximity of British coal fields to tidewater adversely affected or the nearness to the European market reduced, but, for the present at least, the European market, because of financial weakness or general chaos, is no longer what it used to be.

The next three items on our list—control of transportation, docking, storing and distributing facilities, experience and good will—are valuable assets which a newcomer cannot readily duplicate. And, if we are to believe the words of an American writer‡ who under the title of "Sabotage in Our Coal Trade" analyzed the situation in a leading commercial paper, the British are exhausting every possibility, are using every means to hold on to these valuable assets. This writer asserts that much of our present coal exports pass through British hands, British firms using their middleman's position for the purpose of keeping intact their trade connections, and abusing it to prevent the building up of good will toward American coal exporters. Nevertheless, it seems doubtful whether experience can be kept fresh, good will unimpaired and control undiminished if because of changing cost of production here and abroad the actual trade originates in an American and not in a British mine. The ultimate outcome will depend upon the length of time during which British coal exports fall below the minimum requirements of her customers.

Foreign Securities Acquired by Americans

The financial control which Great Britain exercises over some of her foreign coal buyers certainly has not increased as a result of the strain to which the war has subjected British finances. Indeed considerable amounts of foreign securities previously held by British interests have found their way into American hands or others. The same story applies to British maritime supremacy. As yet England is the proud mistress of the seas, but her lead has been cut down considerably. While in 1913 the British merchant marine represented more than 40 per cent of the world's merchant shipping, her share was reduced by 1919 to about one-third of the world's tonnage. It should be remembered, however, that her share of coal-burning vessels and of coal-carrying tramps is greater than this figure indicates.

Before we take up the all-important question of coal as a tonnage equalizer let us turn to the United States and see how our country fares in regard to the items discussed so far. Generally speaking, we find that with us the trend of evolution is just about the reverse of the tendencies just described for Great Britain. Possibly the first two items should be excepted from this statement, for our reserves do not grow larger nor do our seams become thicker and more regular. To the contrary, our coal resources are wasting assets. But the date of the approaching exhaustion is still so far off that we hardly notice its effect while Great Britain does to a considerable extent.

Machine mining is the first factor which gives to this country a decided and increasing advantage.

Machine mining naturally results in a large output per man—that is, a large quantity produced per miner employed.

Labor is the most important cost item in coal mining, and the significance of this item of machine production increases to the extent that the general wage scale as a result of the war has risen more rapidly in Great Britain than in the United States. The result has been that American coal can be offered in European markets at a lower price than English coal of equal quality.

The cost of production is so important in international competition that as to the other minor items discussed above we content ourselves with the statement that on the whole England's loss has been our gain. We have become more prominent in international finance, our banks are expanding to foreign countries, our insurance business is being put on its feet, our merchant marine has grown as no merchant marine ever has in history, so all seems to point in our favor.

Coal an Equalizer of Tonnage in British Trade

As we have seen in the previous installment of this article, however, the most important factor in building up the British coal trade was and is the nature of British imports and exports, the ratio of their respective weights, which lends to coal exports the character of a great tonnage equalizer. There, one might say, America loses out. Indeed at first sight the case looks hopeless. For, as the following table shows, our excess weight—not counting coal exports—lies on the export side and that of Great Britain on the import side.

WEIGHT BALANCE OF FOREIGN TRADE OF UNITED STATES AND UNITED KINGDOM*

	United States (In Million Tons)				United Kingdom (In Million Tons)			
Year Ended June 30	Exports Excl. of Coal	Coal Exports		Imports	Calendar Year	Exports Excl. of Coal	Coal Exports	Imports
1914.....	52.2	....		28.7	1913.....	14.3	73.4	59.3
1918.....	62.8	25.9		29.7	1917.....	7.6	37.8	35.8
1920.....	70.5	27.7		47.5	1919.....	7.7	38.5	41.5

The difference between the weight balance of British foreign trade and that of our own trade is so striking that further comment seems almost superfluous. Great Britain

‡Richard Spillane in "Commerce and Finance."

* All those familiar with government statistics know that the official compilations do not give the weight of imports and exports, so a word should be said about the sources from which our data were obtained. As far as Great Britain is concerned, the Liverpool Steamship Owners' Association and the Chamber of Shipping of the United Kingdom have made the necessary calculations. The information for this country was obtained from two sources. The United States Shipping Board, through its Division of Planning and Statistics, issued a series of bulletins entitled "Trade and Shipping Between the United States and the Principal Regions of the World in 1914 and 1918," which contain much material helpful for our purpose. Then the National City Bank of New York in "The Americas" under date of October, 1920, in an article entitled "Is Our Foreign Trade Prosperity Fictitious —1920 Compared with 1914" has made a careful calculation for 1914 and 1920 of the weight of all articles having a valuat'on of more than one million dollars in 1914 for which weight—expressd in pounds—could be ascertained. The e commodities are said to represent approximately 70 per cent of the total trade of the country. Supplementing this material with that supplied by the Shipping Board we arrived at the figures given in our table.

without coal exports would have an enormous excess of imports over exports, amounting to 45,000,000 tons in 1913. On the other hand the case of the United States is just the reverse, the excess of our exports over imports—without coal—amounting to 23,000,000 tons in the year ended June 30, 1920. The casual observer would immediately jump to the conclusion that therefore we have no business to export coal, at least not for the sake of providing a tonnage equalizer and thus helping our merchant marine by improving the load-index* of our tonnage movements.

But the matter is not so simple. We have to look more closely before we can draw conclusions from these figures. In the first place there is one important difference between the foreign trade of Great Britain and the United States. Because of the insular nature of Great Britain all foreign trade is *ipso facto* sea-borne trade. The same, however, does not apply to the United States. To bring the two sets of figures under a common denominator we have to deduct the rail-borne exports and imports from the totals given for our foreign commerce. The weight of our overland and Lake trade with our neighbors, Canada and Mexico, is not given in the official statistics of the Department of Commerce, but by using certain data furnished by the Shipping Board, estimates of the quantities moving in this way are possible. We have compiled the results of our calculations in the following table:

RELATION OF SEA-BORNE TO TOTAL FOREIGN COMMERCE OF THE UNITED STATES

Fiscal Year	Weight of Total United States Exports	Weight of Sea-borne Exports in Million Long Tons	Weight of Total Imports	Weight of Sea-borne Imports
1914	52.2	30.9	28.7	21.1
1918	62.8	34.4	29.7	20.6
1920	70.5	38.6	47.5	34.2

It appears from this table that a much larger portion of our exports moves overland than is the case as regards our imports. This means that as far as sea-borne trade is concerned the excess of our exports over imports is considerably reduced. Before definite conclusions can be drawn which will enable us to estimate the economic value of coal exports as a tonnage equalizer further calculations are necessary. These will be given in the concluding installment.

CONTRIBUTIONS TOTALING MORE than $35,000 have been received by William Green, international secretary of the United Mine Workers of America, for a memorial to John Mitchell, ex-international president, Mr. Green made known Dec. 13. Of this amount $25,000 has been given by the Illinois district. More than $10,000 has been received from locals throughout the United States. A resolution authorizing the memorial was passed at the international convention at Cleveland last spring, and the matter was turned over to the International Executive Board. At a meeting of the board in Indianapolis last summer a special committee was appointed to consider plans for raising money and erecting the memorial. Mr. Green was appointed chairman. Mr. Green said that the form of the memorial has not been considered. Not until contributions are all in will this be decided.

IN NOVEMBER, 1920, there was moved down the Kanawha River a total of 2,040,000 bushels of coal, or 81,600 tons, as compared with 1,068,500 bushels, or 43,700 tons, during November, 1919. Despite dull market conditions Kanawha River coal shipments in November were 7,520 tons in excess of October shipments, which amounted to 1,852,000 bushels, or 74,080 tons.

A CARGO OF AMERICAN coal was sold by public auction during the week ending Dec. 11 at Stockholm at prices ranging from £2 to £3 10s. per ton, according to the *Colliery Guardian*.

*By the term "load-index" is understood the ratio of the deadweight tonnage required for the movement of goods in one direction to the deadweight tonnage required to carry the goods moving in the opposite direction. The ideal "load-index" for a trade route is 1.00.

State Laws on Use of Electricity in Coal Mines Issued by Bureau of Mines

TECHNICAL Paper 271, "Mining Laws on Use of Electricity in Coal Mines," by L. C. Ilsley, electrical engineer of the U. S. Bureau of Mines, was recently issued by the bureau. This report, which presents the results of a study of the different state codes, has a threefold purpose—to show by comparison the relative attention given by lawmaking bodies of the different states to the safe use of electricity in coal-mines; to list and explain the object of the more important regulations and to cite examples of regulations now in effect.

The laws or rules relating to electricity are in this report grouped under three main heads: (1) Rules relating to general safety in use of electricity underground; (2) rules relating to underground electrical apparatus; (3) rules relating to underground circuits.

Thirty of the states in the Union have coal mines and twenty-eight have regulations prepared by commissions or have passed laws governing the operation of coal mines. The codes may be grouped as follows: Twelve that are distinctly coal mining, eight that are essentially coal mining but also apply to other mines, five that refer partly to coal mines, and four that are essentially metal mining but apply in whole or in part to coal mining. Pennsylvania has separate codes for the anthracite and bituminous fields. It was the first state to have a coal-mining law of any kind, in 1869. By 1890 thirteen states had coal-mining statutes. Before that year electricity was little used in mines, and these early codes contain practically no provisions regulating its use. Since that date, however, the application of electricity has made such progress that now there is hardly a task or operation connected with coal mining that is not directly or indirectly concerned with electricity—for example, lighting, drilling, undercutting, shotfiring, hauling, hoisting, signalling and pumping.

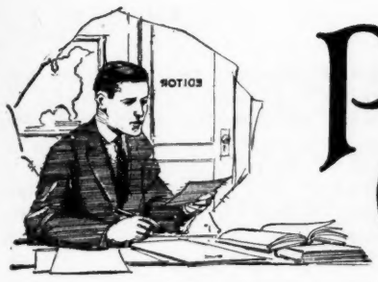
Most of the mining codes have been changed by amendment or complete revision and now twenty-one states make some reference in their coal-mining codes to the use of electricity. The rapidity with which electrical equipment has entered into the many phases of mining has greatly exceeded the advance of regulations governing its use. Even the best electrical mining codes in force need modernizing.

Electrical equipment for mines, in order to be safe and efficient, must be properly designed, carefully installed, inspected at regular intervals by competent men, and maintained in good working condition. In general, the best way to obtain satisfactory electrical equipment for mine service and to insure its proper installation, inspection and maintenance is for each coal-mining state to make and enforce fundamental rules and regulations relating to the use of electricity and electrical equipment in and about coal mines.

THE SENATE JUDICIARY COMMITTEE on Dec. 20 considered the bill passed recently by the House repealing the war laws, including the Lever Food and Fuel Control Act. Sentiment was divided on the Lever law repeal, some Senators favoring its repeal while others thought some portions of the law should remain in force. The committee referred the war repeal bill to a subcommittee for further consideration and report, which is not expected until some time in January. The subcommittee consists of Senators Sterling, South Dakota; Brandegee, Connecticut; and King, Utah.

THE SALE BY THE Secretary of Interior under regulations to be approved by him of the remainder of the segregated coal deposits in the Choctaw and Chickasaw Nations of Oklahoma, estimated at 379,284 acres, valued at $11,273,715, is provided for in a bill reported from the House Committee on Indian Affairs.

REPRESENTATIVE SINCLAIR, OF NORTH DAKOTA, has presented to the Senate a petition of the Commission of the City of Fargo, N. D., advocating legislation to place control of the coal industry under the Interstate Commerce Commission.



Problems of Operating Men

Edited by James T. Beard

Cutting and Loading Machines in Working Low Coal

Handling and Loading the Coal by a Coal Loader at the Working Face in a Low Seam, is an Important Factor in Keeping Down the Cost of Operation—In the Use of That Machine Combined with the Arcwall Coal-Cutter, the Work of Mixing a Thin Seam Is Greatly Expedited

HAVING followed with deep interest the discussion regarding the best method of mining a 35-in. seam of coal, I beg to offer a few suggestions that may prove helpful where the room-and-pillar system of working is adopted and the conditions are such that the method I am about to propose can be employed.

The best results are obtained when the rooms are driven about 24 ft. wide and the coal is cut by means of an arcwall machine having an offset cutter-bar. This machine will cut about double the amount of coal that can be cut with a shortwall machine, because of the fact that the machine does not have to be loaded and unloaded but stays on the track while cutting the coal. The offset bar enables an arcwall machine to cut the coal at or near the bottom.

Requires No Loading or Unloading

The fact that this machine requires no loading or unloading is a prime feature in the working of low coal. While its price is considerably higher than that of the shortwall coal-cutter, the investment in cutting machines would be no greater but probably less, owing to the greater capacity of the arcwall machine for cutting coal and fewer machines being required for the same work.

In Fig. 1 are shown two views of a Jeffrey car loader. On the left of the figure, the machine is shown entering a room in a low seam of coal and propelled by its own power. Only the rear or loading end appears in this cut. Lying in the conveyor by which the coal is carried back into the car, will be observed the rope, block and jackpost used when hauling the scoop by which the coal is dragged along the floor till it falls into the trench where it is caught by the conveyor and carried back into the mine car standing on the track back of the loader.

Operation of the Loader Is Simple

On the right of the figure, the same machine is shown in operation. Here one man is seen guiding the movement of the scoop or scraper. Back, at the side of the machine, is a second man holding the rope taut that passes over the capstan or driving pulley on the machine. This affords an easy means of operating the scoop backward and forward when pulling the coal to the machine. The same man also operates the machine, while a third man not seen in the figure trims the cars, removing each as loaded and setting an empty in its place.

In Fig. 2 are shown three cuts, the upper one representing an arcwall machine, starting to cut a rib of coal on the right. Just below is a second cut showing the coal in the end of the conveyor of a coal loader, about to be dumped into a mine car standing on the track in the rear of the loader. Below this, again, in a third cut, is shown the broken coal being scraped along the floor and dumped into the loading end of the conveyor in the bottom of the trench. In the use of this loader in a thin seam, the best plan is to take up from 10 to 12 in. of bottom, which will give the required headroom on the road.

As shown in Fig. 2, the track is laid in the center of a room and the coal cut on either side to a depth of 3 yd. The use of steel track ties not only gives greater headroom, but is an advantage otherwise. The mine cars should be made low and as wide and long as conditions will permit. The loading end of the car should not be over 24 in. high.

A manila rope is used to operate the scraper to which one end is attached. The rope then passes through a block that is made fast to a jackpost set firmly between the roof and the floor. The operator gives the rope one or two turns around the capstan at the rear end of the machine and, by holding the loose end of the rope more or less taut, he is able to control the movement of the scraper at will.

The Arcwall Coal Cutter

Where the track is well laid and other conditions favorable a single arcwall machine can cut twenty places in an 8-hr. shift. The amount of coal produced will, of course, depend on the thickness of the seam and other local conditions. In any case, the work should be planned on the basis of units, each unit consisting of one cutting machine and a sufficient number of loaders to load the coal broken down, whether the shooting is done between shifts or follows up the cutter while the machines are at work.

The work of drilling, shooting, timbering, tracklaying, etc., should be done by men employed for the purpose so that everything will be in readiness for the machines, which must not be kept waiting. Under favorable conditions, each loader can load from 70 to 75 tons of coal in an 8-hr. shift. Assuming conditions such that a single cutter can

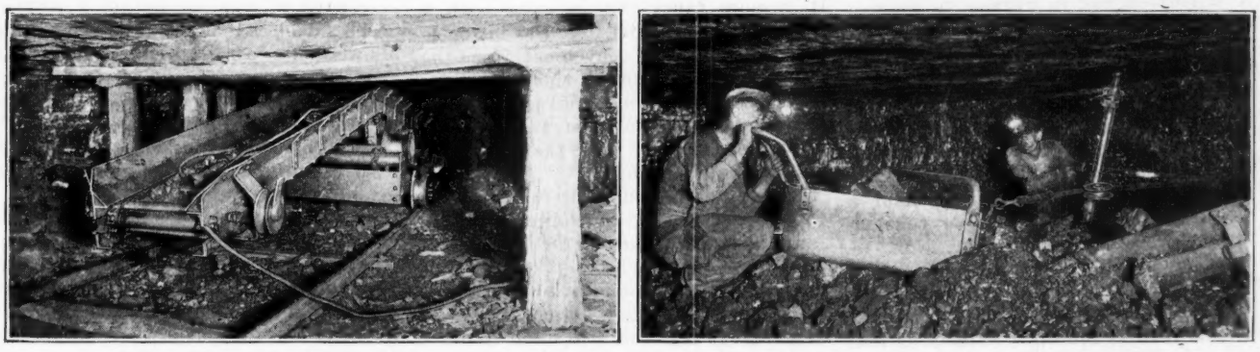


FIG. 1. SHOWING THE MINE-CAR LOADER ENTERING A ROOM AND ITS OPERATION AT THE FACE

keep five loaders busy, the output of coal from a single unit would be, say 5 x 70 = 350 tons per shift.

In the adoption of this system of cutting and loading coal, the entire work must be planned to suit conditions in the mine. It may be found practicable and preferable to drive the entries ahead and use the arcwall machines to cut out the ribs only, instead of taking a full sweep of the face in driving each face forward.

When drawing back the pillars, it is possible to load the coal on the same track as when driving up the room.

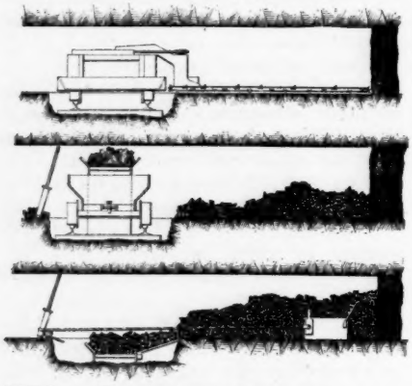


FIG. 2. DIAGRAMMATIC SECTIONAL VIEW OF CUTTER AND LOADER AT WORK IN THIN COAL

In that case, however, it will be necessary to stow all refuse on one side of the track and keep the other side clear for the operation of the scoop in dragging the pillar coal over to the trench at the center of the room.

Fig. 2 shows only a half cross-section of each room and a portion of the pillar separating that room from the one next adjoining. There will be required one or two gathering locomotives for handling the cars and hauling the empty and loaded trips in and out of the mine as the work proceeds. Where conditions favor the adoption of this method it has been possible to increase the daily tonnage of the mine and reduce the cost of production in a remarkable manner.

N. D. LEVIN, Chief Engineer,
The Jeffrey Mfg. Co.
Columbus, Ohio.

Engine-Plane Haulage

(Correction)

A miscalculation in answer to inquiry estimated the size of wire rope required in engine-plane haulage as one-half inch, instead of one inch.

ATTENTION has been kindly called by George S. Whyte, president Macwhyte Co., Kenosha, Wis., to an obvious slip in the calculation of the size of wire rope required to haul a load of 25 tons up a 15½ per cent incline 365 ft. long, *Coal Age*, Nov. 18, p. 1049.

Beginning with the fourth paragraph in the reply to this inquiry, the text should read as follows: Without serious error in this case, the grade resistance can be taken as 20 lb. per ton for each per cent of grade. Allowing, say 1,000 lb. (½ ton) for the weight of the rope, the total load hauled when the trip is at the bottom of the incline will be 25½ tons. Then, for the sum of the track and grade resistances, or the load on the rope, we have $25\frac{1}{2}(20 + 20 \times 15.5) = 8{,}415$ lb., say 4.2 tons.

Using a factor of safety of 5 in determining the size of rope required, gives a breaking strain of $5 \times 4.2 = 21$ tons. Then, since the breaking strain of a 1-in., cast-steel, six-strand, seven-wire haulage rope is 32 tons, the diameter of rope required in this case is

$$d = \sqrt{21/32} = \sqrt{0.656} = 0.81 \text{ in.}$$

But to allow for the wear of the haulage rope, we will use a one-inch, cast-steel wire rope.

In his letter, Mr. Whyte prefers to use a factor of safety of 7 instead of 5, in order to make allowance for the wear of the rope in mine haulage. Though he arrives at the same result, we believe it is better to use a normal factor of safety of 5, and make the allowance for the wear and tear on the rope the final item. Our thanks are due Mr. Whyte for drawing attention to this matter.—Editor.

Loose and Torn Clothes Often Cause Accidents

One of the generally unsuspected causes of accidents is the loose or torn clothes of the worker. Another cause almost as frequent is his unfamiliarity with the work to be performed.

WHILE no one will deny the fact, so often stated in *Coal Age*, that the largest number of accidents in mines are due to the fall of slate and coal at the working face, it is equally certain that there is a large number of preventable accidents that result from mine workers not being dressed in a manner suited to their work.

That being true, it is more than ever the duty of mine officials to give close attention to the fact. For instance, I could mention several accidents that have occurred as a result of drivers and brakemen wearing a glove with a large cuff. This style of glove is often sold at company stores.

GLOVES AND TROUSERS MUST FIT TIGHT

The attractive feature of the glove with a large cuff is that it gives a little wild-west appearance to the wearer. It is more fancy than a glove with a short knit wristband, but the latter is safer and more convenient for the worker. Storekeepers should be induced to discontinue the sale of the large cuff gloves to mine workers, and recommend in their place the glove with a short knit wristband.

Equally dangerous is it for a worker to wear loose or torn clothes, particularly a loose jacket or torn trousers legs. No one employed about cars or chain machines should allow his pants to become ragged, or wear trousers with large baggy legs that are liable to catch in the cars, switch rails or other machinery. To avoid that trouble some workmen wear high shoes and leggins, although these are heavy and tire one who has to do much traveling about.

When a miner is called from the face, or a tracklayer or timberman is taken off the road to fill the place of a brakeman or runner, the foreman should caution the man to tie up the bottom of his trousers or tuck them inside of his socks, and put his loose jacket or coat inside of his overalls. He should have nothing loose or hanging about him that is liable to catch when he is at work.

HOW ACCIDENTS HAPPEN

Accidents frequently happen to men who are taken from the working face or other place in the mine and asked to do work with which they are not familiar. A green man will tire quickly and, in that condition, he is not as sure-footed and does not think as quickly as a man who knows the job.

The average man will not care to admit that he is tired and, urged by the motorman who is anxious to get cleaned up and out of the mine, the fellow will do his best to hurry and, perchance, meet with an accident that would not have befallen a man more accustomed to the work.

Another matter worth mentioning is having a good set of signals. Light signals are generally better than shouting, which is apt to be confused with the shouts of other workmen. With proper training, light signals should be well understood by everyone working in the mine.

When gathering cars it is a bad practice to attempt to push several cars back into a room over a poor track. Not infrequently such a practice will result in accidents. Again, drivers and brakemen should insist on the clearance space at the side of all haulage roads being kept clear and free from refuse or other obstructions. Foremen and assistant foremen who are interested in mine safety should do the same.

G. E. DAUGHERTY.
Pikeville, Ky.

Make the Mine Safe

Where the law fails to specify all that is required to make the mine safe, the responsibility for safety rests heavily on the mine officials in charge.

NOT long ago, I remember the question was raised by a correspondent in regard to whether or not a certain fireboss violated the mine law when he allowed the air returning from the head of a pair of entries generating gas to pass through a number of rooms in which miners were working with open lights, while locked safety lamps were required at the face of each of the headings.

To my mind, the question is more one of making the mine safe, regardless of what the mining law requires. In this particular instance, it would have been better to have constructed a temporary overcast for the purpose of conducting the intake air across the return into the rooms, thus ventilating them by a separate air split, instead of running

the risk of permitting the use of open lights on the return current of a place generating gas.

Consider for a moment the chances of these live entries striking a large gas feeder, which is quite possible, particularly where the seam contains clay veins or spars. The Bituminous Mine Law of Pennsylvania (Art. 25, General Rule 18) alludes to the danger that exists in cutting clay veins, spars and faults. The rule requires, in such cases, that a drillhole be kept 3 ft. in advance of the coal face or of any shothole.

The Law Specifies One Danger

This is one instance where the mine law makes a specific reference to a possible danger. But, in many other cases, the law does not specify what is required to make the operations in the mine safe, and it is then more than ever important that the mine foreman and his assistants shall use every precaution for safety, and adopt rules and regulations to suit the peculiar conditions in the mine of which they have charge.

Every practical mine foreman of experience knows that there are many things lacking in our mining laws, and it goes without saying that it is up to the mine officials to supply this deficiency and establish such rules as are necessary for the guidance of all employees in making their work safe. It cannot be expected that the mining law will be complete in every respect, as conditions vary in almost every mine. There are of necessity many points that must be left to the supervision and judgment of the men in charge.

Open Lights in a Gassy Mine

Speaking of conditions varying in different mines, I remember working in a mine, in the Pittsburgh district, where open lights were used throughout the mine. At the same time, when making my rounds in that mine I could run my cap lamp along the rib of the coal and light small jets of gas coming from the pores. The circulation of air was such, however, that I never found any stratified gas at the face of any of those workings.

In the instance just mentioned, a great responsibility rested on the shoulders of the management to supply the equipment and power required to maintain the necessary circulation of air in the mine. The mine foreman and his assistants were responsible for seeing that the air current was properly conducted through the mine so that no accumulations of gas were possible. It is not so much a question of providing air sufficient to comply with the requirements of the law; but the circulation in the mine must be such as to keep the places free from gas and safe for work at all times.

In respect to lights, whether the mine is gaseous or non-gaseous, I strongly favor the use of electric cap lamps, and hope the time will soon come when they will be more universally adopted.

Gans, Pa. R. W. Lightburn.

Inquiries Of General Interest

Operating a Fan at Normal Capacity

Does the Obstructing of the Air Current or Short-Circuiting the Same Produce An Effect on the Volume of Air and Water Gage Produced That is Dependent on the Operation of the Fan at What is Said to Be Its "Normal Capacity?"

We desire to ask the opinion of the editor of *Coal Age* regarding certain alleged characteristics of centrifugal fans when operating at what is said to be "normal capacity," or above or below that point. Answers to the following questions will no doubt throw some light on the action of centrifugal fans under varying conditions common in mining practice:

1. What is understood by the expression "normal capacity," as applied to the operation of a centrifugal fan?

2. Assuming a fan is operating below its normal capacity, how is it claimed that any obstruction to the air current circulating in the airways of a mine will not increase the water gage?

3. Again, assuming a fan is operating below its normal capacity, how is it claimed that the water-gage reading is not decreased when the air is short-circuited, at least until sufficient air is passing to bring the fan up to its normal capacity?

4. Finally, assuming a centrifugal fan is working at or above its normal capacity, how is it that any short-circuiting of the current is accompanied with a decrease in the water-gage reading, while an obstruction of the current produces an increased reading?

In asking these questions, I have reference to an electrically driven mine fan, operated by a constant-speed motor and giving a constant speed (r.p.m.) to the fan. I want to ask, also, would these alleged characteristics apply equally to a fan operated by steam power? Can you refer me to any authorities on this subject? Observer.

Gary, W. Va.

Before attempting to reply to the questions asked, we would refer our correspondent to an inquiry on this subject, published and answered in *Coal Age*, Mar. 5, p. 606, which will assist in a clearer understanding.

1. The expression "normal capacity," as applied to centrifugal fans, was evolved in the investigation of the action of this type of fan made by the engineering department of the Jeffrey Manufacturing Co.

In its operation, the point at which a fan develops its highest mechanical efficiency marks what is designated as the normal capacity of that fan. It is claimed that this depends on the intake and discharge areas of the fan being properly proportioned to its other dimensions. When this is the case the fan, it is said, will operate at normal capacity and running at a constant speed will give a constant water gage, regardless of whether or not any air is passing, which depends on the airway being open or blocked so as to impede or wholly prevent the passage of air.

2. We assume that a fan is operated below its so-called normal capacity, when the equivalent orifice of the mine is comparatively small and the theoretical pressure due to the tip speed of the fan, relatively high. This corresponds to a condition in which the airway is obstructed and the quantity of air in circulation not commensurate with the volumetric capacity of the fan or its volume per minute. It is claimed that under that condition any further obstruction of the airway will not increase the water gage appreciably.

3. Again, assuming the fan is operating under the condition just explained, the equivalent orifice of the mine being comparatively small and the volumetric capacity of the fan relatively large, the claim is that short-circuiting the air current will not appreciably decrease the water-gage reading.

The fact of the matter is that in each of these two cases the fan is throttled to such extent that changes in the airway have an almost imperceptible effect on the water gage, which is practically determined by the fan and not by the airway. It is admitted, however, that some slight change does take place in the water-gage reading.

4. We assume that when a fan is operating above its so-called normal capacity the condition corresponds to a comparatively large equivalent orifice of the mine or airway, and a relatively low volumetric capacity of the fan. This is the reverse of the condition in the two previous cases. Now, instead of the fan being throttled, it is running under a light resistance. In this case, any change in the mine or airway, either obstructing the flow or short-circuiting the air, produces a relatively large effect on the water-gage reading.

The correspondent has assumed a constant-speed motor driving the fan, and asks what difference would be manifest if the fan was operated by steam power instead. In that case, ob-

servation has shown that any obstruction to the flow of air in the mine or airway has the effect to reduce the quantity of air passing through the fan and the mine. But, since the power varies as the cube of the quantity of air in circulation, it is clear that the power absorbed and lost in the fan varies rapidly. For example, if the volume of air passing is reduced one-half, by the obstruction of the airway, the power absorbed in the fan and lost is but one-eighth of the previous amount and, as a consequence, the fan runs faster than previously.

On the other hand, a short-circuiting of the air current has the effect to increase the quantity of air passing through the fan and the mine. In that case, if the volume of air is doubled, by short-circuiting the current, the power lost within the fan is 8 times what it was previously and, as a consequence, the fan runs slower.

Likewise, a similar effect is produced on the water gage, which is increased when the flow of air is obstructed and the fan runs faster, but is decreased when the air is short circuited and the fan runs slower.

Examination Questions Answered

Examination for Mine Foremen Twelfth Anthracite District

(Slected Questions)

QUESTION—*A breast is driven 150 ft. in length, 24 ft. in width, the thickness of the seam being 10 ft.; how many tons of anthracite should the breast yield, after deducting two-tenths of the cubic contents as refuse and assuming that one cubic yard of anthracite weighs one long ton?*

ANSWER—Allowing two-tenths of the cubic contents as refuse, we can call the thickness of the seam 8 ft., instead of 10 ft., which gives for the net cubic contents,

$(150 \times 24 \times 8) \div 27 = 1{,}066\frac{2}{3}$ cu.yd.

Then, estimating a cubic yard as one long ton, the weight of coal obtained from this breast would be $1{,}066\frac{2}{3}$ long tons.

QUESTION—*If the quantity of air circulated in a coal mine is 90,000 cu.ft. per min. when the water gage is 2 in. what quantity of air would be circulated by a water gage of 3 in.?*

ANSWER—Assuming there is no change made in the circulating system in the mine, the quantity of air passing will vary as the square root of the pressure or water gage. In other words, the quantity ratio is equal to the square root of the water-gage ratio. Therefore, calling the increased quantity of air x, we have

$$\frac{x}{90{,}000} = \sqrt{\frac{3}{2}} = \sqrt{1.5} = 1.2247$$

$$x = 90{,}000 \times 1.2247 = \text{say } 110{,}200 \text{ cu.ft. per min.}$$

QUESTION—*What is the principal purpose of the law in requiring the employment of a practical and competent mine foreman?*

ANSWER—The Anthracite Mine Law makes it unlawful for "any person or persons to act as mine foreman, or assistant mine foreman of any coal mine or colliery, unless they are registered as a holder of a certificate of qualification or service under this act; or unless, in the judgment of the employer, he is a person possessed of qualifications which make him equally competent to act in such position." (Art. 8, Sec. 1.)

The wording of this section certainly gives a very wide meaning to the words "equally competent," which is left to the "judgment of the employer." It would be a wild guess to say what is the purpose of the law in requiring this degree of competency. The law is more specific, however, in its requirement that the holder of a certificate of competency to act as foreman or assistant foreman of a mine, must have had "at least five years practical experience as a miner" (Sec. 4), and the "equally competent" proviso can hardly change these figures, however slack the judgment of the employer.

The purpose of requiring "five years practical experience as a miner" is to insure that each candidate for the position of foreman or mine foreman shall have had the opportunity to become thoroughly familiar with mining conditions and work. What use he has made of his opportunities, however, is unfortunately, left to the judgment of his employer, instead of being determined by a regularly authorized examining board.

QUESTION—*What are the chief factors of danger in coal mines?*

ANSWER—It can be said that the principal source of danger in mining coal is the possible fall of roof, slate and coal. Next to this follow the movement of cars, ignition and explosion of gas and dust, the presence of electric wires and, finally, the absence of or disregard for safety rules, regulations, appliances and danger signs and signals.

QUESTION—*If there is a water gage of 2 in. indicated on a door measuring 5 ft. 3 in., by 3 ft. 9 in. and located between the intake and return in a mine; what is the total pressure on the door?*

ANSWER—A water gage of 2 in. corresponds to a pressure of $2 \times 5.2 = 10.4$ lb. per sq.ft., which is the unit pressure exerted on each square foot of the surface of the door. The area of the door is $5.25 \times 3.75 = 19.6875$ sq.ft. The total pressure on the door is, therefore, $10.4 \times 19.6875 = 204\frac{3}{4}$ lb.

QUESTION—*How would you timber the foot of a plane 30 ft. in width, in a seam 22 ft. in thickness, the rock above the vein at this point having fallen at various times, leaving a space of 15 ft. above the coal and making the total height from the floor to the roof of the cave 37 ft.? The pillars at this point are somewhat shattered from a previous squeeze.*

ANSWER—This is a dangerous situation, in respect to making the place safe for future development. A span of 30 ft. is too great for any unsupported crossbeam. Also, the shattered condition of the pillars on either side of the plane makes it impracticable to depend on these for support. The first step is to build two solid cribs or cogs one on each side of the plane, putting in temporary supports and removing a portion of each pillar if necessary, for that purpose. The remaining portion of the pillar and the surface of the ribs should then be protected with a coating of "gunite." In addition to these two cribs, one on each side, there should be built two like cribs between and on line with the first two, making three spans, each about 10 ft. center to center. Over these cribs and supported by them, steel girders or heavy timber crossbeams should be placed and the space above built up by cribbing to the roof of the cave.

QUESTION—*What precautions would you use in flushing a district of a mine where men are working in a lift below?*

ANSWER—Before this work is begun, strong dams must be built that will control the flow of water in the proper channels and make sure that it will not flood the lower workings. When flushing is started, the work must be carefully watched to see that the water drains off and there is no accumulation of water that would endanger the men working below. Should there be any doubt in this regard the men should be promptly withdrawn and the work of flushing discontinued for a time, or till all danger is past.

QUESTION—*(a) To what extent does the barometric pressure vary? (b) The height of the barometer being given, how do you find the air pressure per square foot?*

ANSWER—(a) In this country, there is a considerable variation of barometric pressure, commonly included within a range of 2 in. of mercury, depending on the near approach or proximity to atmospheric storm centers. Though quite exceptional, there are records, however, showing a range of 3 and even $3\frac{1}{2}$ in.

(b) To find the atmospheric pressure, multiply the reading of the barometer expressed in inches by 70.7. Thus, the atmospheric pressure corresponding to a barometric pressure of 30 in. is $30 \times 70.7 = 2{,}121$ lb. per sq.ft. Since 1 cu.in. of mercury weighs 0.491 lb., each inch of mercury column corresponds to a pressure of $0.491 \times 144 = 70.7$ lb. per sq.ft.

Southern Operators Plan Organization of Tidewater Coal Exchange at Charleston

STEPS toward the organization of a Tidewater Coal Exchange at Charleston, S. C., were taken at a meeting in Washington, Dec. 29, of various coal and railroad interests with Vice President Green of the Southern Ry. Dr. Henry Mace Payne, consulting engineer of Andrade-Eyre, Inc., of New York, who has taken an active part in the work preliminary to the organization of an exchange at Charleston and who issued invitations for the meeting, presided and explained the advantages to be gained by Southern rail and coal interests through the new organization. After an exchange of views a committee was appointed to prepare rules and plans for the organization of the exchange, which will be considered at a later meeting.

Appoint Committee; Dr. Payne To Assist

The committee is composed of J. E. McCoy, secretary of the Southern Appalachian Coal Operators Association; Gibbs L. Baker, Washington, D. C., attorney for Tidewater Coal Exchange, Inc., and F. C. Koenig, of the Alden Coal Mining Co., Export Coal Co., Harlan Coal Co. and A. McNeil & Sons Co. Dr. Payne will assist the committee.

In explaining the desire to establish an exchange at Charleston, Dr. Payne stated that the facilities at Hampton Roads, Va., were taxed to their capacity and the establishment of an exchange at Charleston would open up a greater market for coal on the Clinchfield and allied lines. Charleston had piers and other facilities capable of handling the coal and operators and shippers had asked that the matter of an exchange at Charleston be considered.

Would Insure Saving in Demurrage Charges

Dr. Payne said that an exchange would be advantageous in the matter of quick turnover of cars; would benefit the railroads in the use of rolling stock, and that the facilities afforded to operators for classification and inspection would insure the loading of ships without undue demurrage. The Tidewater Coal Exchange, Inc., now operating at Baltimore, New York and Philadelphia was friendly to the organization of an exchange at Charleston, and was willing to aid it in every way, either as a branch of the present exchange or as an independent exchange. He invited fifty-three of the large coal companies which might be interested in Charleston shipments to attend the meeting, and received replies from forty-eight showing a general interest in the plan.

The present unfavorable export situation, Dr. Payne said, would not last, and he predicted that there would be more or less exportation of coal for the next nine or ten years, according to information from the Bureau of Mines, Geological Survey and Department of Commerce. This trade would be principally with the Mediterranean and South American points, and generally there would always be an export market for coal. He said the Andrade-Eyre company was ready to go in a transshippers association or a tidewater exchange which would give the general benefits of pooling at Charleston. Referring to the benefits of an exchange in classification, he said the present exchange had demonstrated that coal can be classified and pooled and properly inspected, and when the difference in car and ship demurrage cost was considered the value of an exchange was apparent. He favored the establishment of an exchange at Charleston by February or March next.

J. W. Howe Cites Advantages of an Exchange

Mr. Green, vice president of the Southern Ry., said the coal dealers and shippers desired a coal pool at Charleston, as they realized that it would be to their advantage. He was impressed with a statement by J. W. Howe, commissioner of the Tidewater Exchange, that that organization had reduced classifications from 1,150 to 50. Mr. Howe gave the following figures as to the advantages of the exchange:

Tonnage dumped, 48,785,000; number of cars dumped, 967,800; car days saved on gross detention basis, 1,747,600; saving on per diem basis, $1,048,560; cost of operating exchange, $470,844; number of cars saved, 47,035.

Mr. Green and others familiar with the Charleston situation said there were sufficient facilities at Charleston to handle coal, as there are now 175 cars of coal in the port and some days there are 800 cars, but that there were not sufficient boats and the present tipple was not adapted to loading boats in the export trade. Dr. Payne said the capacity of the dumping facilities at Charleston is now 75,000 tons a month, but he thought that an enormous coal business could be built up at Charleston through an exchange. His company was ready to contract for a large tonnage in the coal region tributary to Charleston if it could be assured of classification and shipment of coal from the port.

Mr. Howe gave the average cost per ton of handling coal at the present exchanges at less than 1c. a ton and the exchanges were operated with a detention of less than three days from 1917.

Would Assist in Developing Export Trade

Mr. McCoy said the operators on the main line of the Southern Ry. were not interested in the export of coal, but that there were some on other lines who were interested in developing exports. He thought, however, that some tonnage on the Southern would move to export if there was a demand for it and he believed that operators in that region could be interested in the benefits of an exchange.

Dr. Payne in pointing out further advantages of an exchange said that at exchanges now only 5c. per car is allowed for demurrage while at Charleston and other points without exchanges the allowance would be $1 because of the possibility of the coal being held up without exchange facilities.

Mr. Koenig said there was no question that the railroad facilities at Charleston could handle the coal situation under an exchange, which should be established to guarantee foreign purchasers that the coal was of uniform quality. Without an exchange there was no inspection and classification to prevent bad coal from being exported and thereby reflecting on American coal. The exchange would save demurrage and embarrassment. He thought the Southern Ry. would co-operate. John A. Gerety and others also favored the exchange.

Mr. Green asked if all the coal companies could be brought into the exchange and Dr. Payne pointed out that when the present exchange was organized it represented only 17 per cent of the coal men, while now it included more than 60 per cent. Mr. Green said he would take up the matter with other railroad officials and that the Southern was in sympathy with the movement.

Prominent Coal Operators Represented

Those in attendance or who accepted invitations to attend the conference were H. C. Bates, representing C. W. Hendley & Co.; John A. Gerety, of the Ainesworth Coal & Iron Co.; J. E. McCoy, secretary of the Southern Appalachian Coal Operators Association; G. Santi, of the American Coal Exchange; F. C. Koenig representing the Alden Coal Mining Co., Export Coal Co., Harlan Coal Co. and A. McNeil & Sons Co.; Guy Darst, of the Bewley-Darst Coal Co.; Howard Adams, of the S. M. Hamilton Coal Co.; William Curran, representing the B. & O. R.R. Kentucky operations; Dr. Henry M. Payne, of Andrade-Eyre, Inc.; E. R. Thompson, of the Federal Coal Co.; J. G. Morris, of the South Atlantic Coal Co.; K. W. Dyas, of the Stearns Coal & Lumber Co.; H. W. Oswald, of Coale & Co.; Mr. Doll, of the Tuttle Corporation; B. W. Shenlin, of the Lake & Export Corporation; J. W. Howe and Gibbs L. Baker, representing the Tidewater Coal Exchange, Inc.; J. L. Graves and J. E. Fitzwilson, of the Southern Ry.; R. L. Maxey, of C. M. Emmons Co., and Paul Delaney, secretary of the Benedict Coal Corporation.

Coal-Mine Power Rates To Be Discussed

A MEETING of the local sections of the American Institute of Electrical Engineers and the American Institute of Mining and Metallurgical Engineers will be held in the Bureau of Mines Building, at Pittsburgh, Pa., Jan. 21, 1921, beginning with a technical session in the afternoon lasting from 2 to 4:30 p.m. Between 4:30 and 6 p.m. the members will visit the Bureau of Mines Building and the Carnegie Technical School and in the evening some form of entertainment and a dinner will be provided. The technical program will cover two or more papers, one on "Gathering in Coal Mines" and one on "Power Rates for Coal Mines," the latter paper to be read by F. W. C. Bailey, consulting engineer, of Columbus, Ohio. President Hoover of the A. I. M. E. and President Beresford of A. I. E. E. have both promised to be present.

What Labor Seeks from Indiana Law Makers

BILLS changing the present workmen's compensation laws of Indiana, introducing old-age pensions, prohibiting labor injunction, modifying or rewriting the garnishee law, creating an industrial court similar to that in Kansas and providing a state constabulary are among those which will be presented in the Legislature during the coming year. The first four will have the approval and support of the United Mine Workers, according to William Mitch, secretary-treasurer of District No. 11, the largest district in Indiana. The last two will be fought to a finish.

The miners say the rate of compensation as designated in the present compensation law is as originally enacted in 1915, when conditions were greatly different from those now existing. They say this rate is inadequate and an effort will be made to raise it from 55 per cent of the average weekly earnings to 65 per cent and to advance the minimum computing basis from $24 a week to $30 a week. According to Mr. Mitch the law at present does not provide that all hazardous occupations come under its provisions, and this will be one of the features for which a change will be asked.

With regard to the anti-injunction law, Mr. Mitch said in a recent interview: "The anti-injunction has always been favored by labor, because of the abuse of injunctions in labor controversies, and labor will endeavor to have such a law enacted. It is recognized that in this period the tendency is to pull labor down, and while no doubt there will be legislation proposed that will be antagonistic to the views and rights of labor, such as the Kansas Industrial Court law, the workers certainly will fight such freak legislation with all vigor and power.

There has been much activity to obtain the passage of a bill creating a state constabulary similar to that in Pennsylvania, but as Mr. Mitch views it the agitation is camouflage. He says the law is ostensibly written to protect the former, but its specific purpose is to fight for the open shop.

U. S. Chamber of Commerce Committee to Study State Control of Prices

STATE control of prices as provided in statutes now in effect in Montana and Indiana is to be made the subject of study by a special committee of the Chamber of Commerce of the United States, appointment of which was announced Wednesday, Dec. 22, by Joseph H. Defrees. The constitutionality of both statutes involved is being tested before the U. S. Supreme Court.

Charles Nagel, of St. Louis, formerly secretary of the Department of Commerce and Labor, is chairman of the committee. Other members are Max W. Babb, Allis-Chalmers Co., Milwaukee; John M. Crawford, Parkersburg Rig & Reel Co., Parkersburg, W. Va.; Clyde C. Dawson, Dawson & Wright, Denver, and Theodore F. Whitmarsh, Francis H. Leggett Co., New York.

Although the same in principle, the two statutes differ considerably. The Montana law is much more general in its application. It makes the state's railroad commissioners a Montana trade commission and gives the board power to license all persons engaged in buying and selling commodities in the state. The power to regulate carries with it the power to establish maximum prices or reasonable margins of profit.

The Montana Trade Commission thereupon ordered that all articles offered for sale be marked with the invoice price and the sales prices per unit. The State Merchants' Association of Montana took the case into the Federal District Court, which held the law in violation of the fourteenth amendment of the Federal Constitution. The Attorney General of the State appealed. The U. S. Supreme Court will hear the case in April.

The Indiana statute refers chiefly to coal and expires in the spring. Immediately after enactment this law was taken before the Federal District Court by Indiana coal operators. The decision of the Court was that the case was brought too soon, as the operators had not yet reason to complain against any attempt of the Coal Commission, created by law, to deal with their business. From this dismissal of the complaint the coal operators appealed to the U. S. Supreme Court.

Men Want Ten Million Dollars Back Pay

DECLARING that the Hillside Coal & Iron Co. and the Pennsylvania Coal Co. had been paying the miners for gross weight instead of net weight, the insurgent unions are demanding a refund of the shortage in wage. It is declared that if the demands are not complied with a strike will take place Jan. 2, 1921. The amount demanded covers the operation for six years and would total $10,000,000.

The mine workers also demand that after Dec. 16, 1920, 12 per cent be added to the weights recorded on the scales so as to compensate for the fact that the weigh beam is graduated in long tons instead of short. They also call on the company to discharge all its weighmen. The company has recently changed the districts of its district superintendents and the mines of its foremen in order that the miners may be better satisfied.

WORK OF THE Council of National Defense in handling coal matters in connection with the recent Bituminous and Anthracite Coal Commissions is reviewed by the director of the Council in the annual report for the year ended June 30 last, just made public.

It is stated that the information collected and co-ordinated by the Council concerning the coal situation in the country was of assistance to the Bituminous Commission in obtaining data upon which to make its award. As a result of the co-operation of the Council with the Bituminous and Anthracite Commissions the Council co-ordinated important information concerning both bituminous and anthracite coal throughout the country.

The Council says the files of its Committee on Coal Production include correspondence with coal-producing companies and railroads, principally with regard to the movement of coal from the mines.

ADVISABILITY OF INCREASING production of coal in the Philippine Islands has been considered by the War and Navy departments and the Shipping Board, which have, however, decided that it is not desirable for them to enter into the mining of coal as operating agencies. They are, however, actively interested in seeing the production of coal increased in the islands and in conserving to their use the necessary quantity of coal. Secretary of War Baker has requested the Philippine Government to include in leases granted to Government lands in the islands a provision to the effect that the U. S. Army, Navy and Shipping Board shall have a preferential right to purchase all coal, oil and gas or any products thereof growing out of concessions granted, upon payment to the producer of the current field or market price of all coal, oil and gas or other products so purchased.

The Weather Vane of Industry

News Notes Chronicling the Trend of Industrial Activities on Which Depends the Immediate and Future Market for Coal

IMPROVEMENT of business activity, according to the *Commerce Monthly* of the National Bank of Commerce in New York, awaits adjustment of retail prices to a level satisfactory to the public. This necessary readjustment of prices to consumers is now under way, and will be expected to make more rapid progress in the future. Its progress will be hastened by the coming into the market of goods which are already being produced on lower cost levels for labor and material.

"The fundamental relationship of banking and business," the report continues, "now becomes clearly apparent. Both are concerned in the present situation, and the interests of both demand that the readjustment be gone through with in orderly fashion, so that business activity may be resumed on a sound basis.

"Sentiment respecting forward conditions, which until lately had been almost uniformly depressed, is now noticeably improving in many directions. This better feeling does not go to the point of optimism, but there is evident a degree of confidence, which was previously lacking, in the ability of commerce and industry to meet the future successfully and to conduct business with reasonable profit.

"What is now required is courage and respect for fundamental economic principles. Artificial palliatives which are being urged with a view to obviating the difficulties of the adjustment—particularly proposals involving further inflation and cheapening of credit—must be avoided. Such measures, if adopted, could only result in the impairment of the strength of the credit structure and in prolonging and increasing the difficulties of an adjustment which world-wide conditions have made inevitable."

Railroads Drop More Men

Following the announcement Dec. 27 by Samuel Rea, president of the Pennsylvania R.R. system, that present business conditions would "necessitate further reduction in the number of employees and in the working expenses and capital expenditures until the situation improves," that company began a drastic cut in its working force in the Southern Grand Division. It is estimated that from 1,700 to 2,000 men will lose their jobs. This amounts to approximately 10 per cent. of the working force. The Southern Grand Division comprises the Delaware, Maryland, Baltimore and Norfolk divisions, employing slightly less than 19,000 men. Maintenance of way, shop, office and transportation workers are affected. Several hundred men employed in the car and motive power shops of the Chicago, Burlington & Quincy R.R. at various places in Nebraska have been laid off, it was announced Dec. 29. George Loomis, assistant general manager, said a satisfactory condition of rolling stock and business depression were responsible. Orders had been issued Dec. 28 to lay off 25 per cent of the employees of the latter company's shops at Aurora, Ill., effective Dec. 31. About 2,000 men are employed there.

Automobile Factory Takes on Men

Since the beginning of September the H. H. Franklin Manufacturing Co. has added two hundred men to the force working at its motor car plant in Syracuse, according to a statement on Dec. 28 by the head of the corporation. Shipments and orders in hand indicated that the sales for December would be the largest in number in the history of the company. Shipments for the week ended Dec. 18 were the largest in any week since June 12. Production during that week ran at a rate of thirty-three cars a day, which was approximately 85 per cent of the average daily production for the year ended Aug. 31, 1920.

Boston & Albany Shops Reopen

The Boston & Albany R.R. car repair shops in West Springfield, Mass., which were closed indefinitely Monday, Dec. 27, throwing nearly 100 men out of work, announced Dec. 29 that they would reopen Monday, Jan. 3. Eighty per cent of the employes were to be taken back. The reason for the change of policy is not announced.

Brooklyn Navy Yard Lays Off More

More than 2,500 workers at the New York Navy Yard, Brooklyn, will lose their places within the next month according to an announcement Dec. 30. Fifteen clerks and several of the drafting force were dismissed Dec. 29.

Silk Mills Resume on Full Time

The Brainerd & Armstrong Co., manufacturers of silk goods, announced Dec. 27 that beginning Jan. 3 the mills would resume operation on full time, forty-eight hours a week, although under a 15 per cent wage reduction.

Ford Motor Plant Closed Till Feb. 1

The Ford Motor Co.'s plant at Highland Park, Detroit, which normally employs from 50,000 to 60,000 men, will remain closed until Feb. 1. The intention was for a suspension of operations during the regular midwinter inventory period of two weeks when the plant closed Dec. 24, but after a conference of officials it was decided to shut down until Feb. 1. Although the plant has been working at full capacity for the last three months, it is known that there had been a considerable falling off in the demand for Ford cars.

N. Y. Central Placing Rail Orders

On the heels of the big order for steel rails by the Pennsylvania R.R. which was announced a short time ago comes the report that the New York Central is in the market for 175,000 tons, 82,000 tons of which have been placed. Of the latter amount 71,000 tons have gone to the Illinois Steel Co. and 11,000 tons to the Carnegie Steel Co. The balance of 93,000 tons is still being negotiated.

Edison Phonograph Works Close

It was announced Dec. 28 that the phonograph works of Thomas A. Edison, Inc., at West Orange, N. J., would close Wednesday evening, Dec. 29, and remain closed indefinitely. The phonograph record department will continue to operate as usual. Approximately eight hundred persons are affected by the shutdown. In the preceding six weeks about 1,200 were laid off.

Merchants Oppose Proposal That Coaling Pier Be Built on Staten Island

THE Committee on Harbor Docks and Terminals of the Merchants' Association of New York in a report opposes the proposal of Dock Commissioner Murray Hulbert that a coaling pier be constructed at Rosebank, Staten Island. The committee asserts that the proposed pier is not required by the public interest and would have little utility.

In a letter to the New York Sinking Fund Commission the committee says that steamship operators and coaling companies are emphatic that bunkering from a pier involves considerable and costly delay, which is avoided by bunkering from lighters, the latter method being therefore much more economical. As to tramp steamships, they can buy their coal so much more cheaply at Norfolk and other ports near the point of production that in many cases it pays them to move there solely for bunkering, in preference to buying coal in New York.

New York Coal Merchants Believe Conditions Are Returning to Normal

AT THE annual meeting of the Coal Merchants Association, Inc., of New York, held on Dec. 14, W. A. Leonard was re-elected president; Arthur F. Rice, secretary, and J. W. Vought, treasurer. The Board of Directors, also re-elected, consists of J. W. Bellis, M. F. Burns, W. D. Butts, G. D. Curtis, T. F. Farrell, H. J. Lange, W. A. Leonard, Frederick Rheinfrank, G. F. Sinram, Olin J. Stephens, N. L. Stokes and L. J. Weber.

Commissioner Rice in his annual report said that the preparation of certain coals has been and still is poor, while the extensive shortage in shipments, very little coal being weighed at the Tidewater ports and everything lost or stolen in transit coming directly out of the pockets of the retailers, has caused no end of trouble and financial loss. He said there has not been a day this year when the dealers could get enough coal to fill the orders they had taken. He believes, however, that the turning point has been reached and that a return to something like a normal state of affairs may be expected in the not distant future.

Committees Named at Executive Meeting of Federated Engineering Societies

HERBERT HOOVER, president of the Federated American Engineering Societies, presided at the Executive Board meeting of the American Engineering Council of that organization, held in New York on Friday, Dec. 17. Every member of the council was present with the exception of A. M. Greene, and two new members of the board were elected: W. B. Powell, of the Buffalo Engineering Society, representing District No. 1 (New York and New England States), and Gardner S. Williams, Grand Rapids Engineering Society, representing District No. 2 (Michigan, Wisconsin and Minnesota).

The president appointed standing committees on Procedure, Constitution and By-laws, Publicity and Publications, Membership and Representation, Finance, and Public Affairs.

In discussing the program of the council immediately ahead Mr. Hoover stated that he had called engineers together in various cities he had visited lately, and that he found that the general desire of engineers everywhere was to join in the Federation movement, but that the general trend was for territorial organization, as distinguished from national organization. One of the stumbling blocks in the way of these territorial organizations joining the national organization was the question of dues. Another complexity was that individuals hold memberships in more than one society.

As a step toward co-ordinating various inter-society activities already established the necessary action was taken to make it possible for certain of the activities of the Engineering Council to be taken over by the new organization. As soon as the United Engineering Societies have passed officially upon the proposed action of the Engineering Council to transfer and continue the work of the Engineering Council's committees who have not yet completed their work, the president will appoint the necessary committees of the American Engineering Council to take over this work.

October Railroad Earnings Short of Estimates at Time of Increase

A TABULATION from figures reported by the railroads to the Interstate Commerce Commission show that the net railway operating income for October of the Class 1 carriers totaled $91,761,090, which is approximately $20,674,000, or 18.4 per cent, below the amount expected to be earned under the increased rates fixed by the commission in accordance with the Transportation Act. The compilation is based on reports received from 203 railroads with a total mileage of 235,837.

On the basis of the net operating income for October, the railroads of the country would earn annually 4.9 per cent on the value of their properties as tentatively fixed for rate-making purposes at $18,900,000,000 by the Interstate Commerce Commission. This is an increase of 0.75 per cent over that for September as computed from the net operating income for that month. To realize a return of 6 per cent on their valuation as provided by the act, the railroads should have earned $112,435,000 in October.

Operating revenues for the 203 railroads totaled $642,341,119, or an increase of 26 per cent over October, 1919, while operating expenses were $522,877,298, or an increase of 28.8 per cent compared with the same month last year. The net income is an increase of 20.2 per cent over that for October last year.

Compilations show that the net operating income in every district fell below a 6 per cent basis, the Eastern district being 29.7 per cent below, the Southern district 16 per cent, and the Western district 9.2 per cent.

Reports show that the net operating income of the 203 carriers for October was 81.61 per cent of the amount expected to be earned by them under the rates fixed by the commission, while the net income for both September and October was 75.37 per cent of the amount expected for both of those months.

Compared with September, the net operating income for October of the Class 1 railroads is an increase of $16,450,779, increases being shown for the Eastern district of $6,576,668, Southern district $1,809,564, and the Western district $8,064,547.

Appropriation Asked for Coal Inspection

THE U. S. Bureau of Mines has recommended an appropriation of $750,000 for effecting the following plan of coal inspection, which it suggests:

"The Secretary of the Interior is hereby authorized and directed to establish through the Bureau of Mines a fuel-inspection system for the purpose of giving to consumers and producers of coal accurate information concerning the quality of coal purchased for domestic and industrial uses and for foreign commerce. Authority is granted the Secretary of the Interior in connection with the establishment of such a fuel-inspection system to provide coal-sampling systems at such points as he may deem desirable, procuring by lease, purchase, condemnation or donation the land or equipment necessary therefor; and to utilize such agent or agencies for obtaining representative fuel samples and make such rules and regulations as he may deem necessary to accomplish this purpose."

THE POINDEXTER ANTI-STRIKE BILL, recently passed by the Senate, according to the report of the Senate committee accompanying it, would apply to coal mines where such coal is essential to the operation of trains and in other industries incidental to and necessary to the maintenance of transportation. The bill makes it a felony punishable by heavy fines for interference with commerce. An effort to reconsider the bill will be made, as it was passed during the absence of the opposition from the chamber.

Economists Study the Bituminous Coal Situation

Industrial Progress Based Upon the Soft-Coal Industry—High Prices Attributed to Consumer's Failure to Realize His Power—Irregular-Operation Losses Ascribed to Unlimited Development of Mines

COAL was given a hearing by the American Economic Association at its meeting in Atlantic City Dec. 27-29, 1920. The papers and discussions were limited to bituminous coal but the interest shown and the breadth of the discussion indicated that this part of the industry has been much in the minds of the members during the last year. James A. Field, vice-president of the association and of the faculty of the University of Chicago, was responsible for the sessions devoted to coal and presided at the meeting. The papers that were read, as pointed out by the chairman, had been prepared by specialists in the field of coal rather than by special economists, and the purpose of the program—a purpose fully realized—was to bring to the college men and professional economists a fuller understanding and closer approach to the problems of this important industry.

The first speaker was C. E. Lesher, editor of *Coal Age*, who spoke on the subject of "An Introductory Survey of the Bituminous Coal Industry." He described the bituminous coal industry of today and of the last thirty years as the "foundation of modern industrial progress, touching the daily life of nearly every individual in the country—simple almost as agriculture in its basic elements, as unorganized as the retail grocery business, limited on the one hand by an almost inelastic market, on the other by transportation, over neither of which has it control."

All Industries Using Coal Essential

He emphasized the importance of the coal industry and said that the fallacy that we can distinguish between essential and non-essential users of coal had been exploded. All use of coal is essential, not necessarily because the product made in every plant is essential but because the continuous and uninterrupted operation of every plant is necessary. Whole communities are often dependent for their existence and livelihood on single industries within their borders and the operation of those industries is dependent on power—that is, on coal.

Coal is not the last thing required, it is the first, yet coal is treated in our national thinking as are such commonplace things as sand and gravel, slag, refuse and waste products. Nowhere is this better shown than in the treatment of coal as traffic by the railroads.

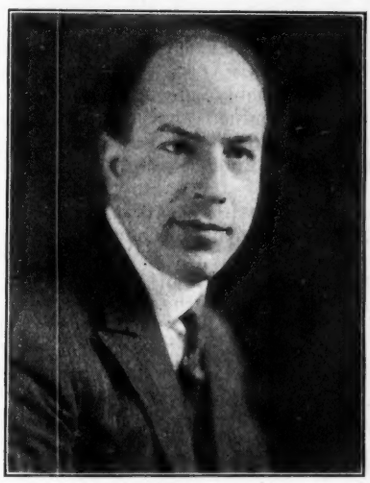
"Freight rates on the railroads," he said, "have been designed to give the operators in each field a wide latitude in markets. There is scarcely a consumer who has not the opportunity to choose his coal within a wide range. The coal deposits are so bountiful, the number of mines so great and it is so easy to increase productive capacity that monopoly in the bituminous coal industry is not possible today.

"The real reason why, with all its associations, the coal industry is unorganized is that the law prohibits combined action with respect to the vital concerns of the trade—price and distribution.

"Consumption of coal in the United States is inelastic. No more coal is consumed than is needed to perform the work at hand or to give the necessary heat. No considerations of price will induce a manufacturer to burn more coal than is required to produce the goods for which he has a market. The consumer today holds the balance of power. The high prices of this year were made by the consumer, and had he exercised his power there would have been no such prices. It was not combination among the coal producers or shippers that caused $10 coal this year, nor was it lack of mines and miners to produce all the coal for which there was demand."

Irregular operation of the bituminous coal industry was the subject of the paper by F. G. Tryon, of the U. S. Geological Survey. Following is an abstract of this paper:

"Bituminous coal mines of the United States have a developed capacity and a present labor force about 30 per cent in excess of what is required to supply the demand. In consequence, the labor and capital engaged in the industry have been idle during the past thirty years an average of ninety-three working days a year, and there is little evidence that the condition is improving. Irregularity of working time is injurious to the miner because it means direct loss of earning power; to the operator because it means higher costs per ton; to the railroads because it means seasonal demand for transportation; and to the consumer because it increases the cost of coal.



W. F. McKENNEY

Due to the increasing amount of coal statistics which the U. S. Geological Survey has been called upon to supply, F. C. Tryon has been furnished an experienced assistant in the person of W. F. McKenney. Mr. McKenney has had long experience as a Government statistician.

"Fluctuations in production may be grouped as (1) annual, resulting from business depressions over which the coal industry has no control; (2) seasonal, reflecting the influence of climate on consumption and therefore on demand; (3) daily, reflecting irregularities in car and labor supply. Remedies which have been proposed to overcome irregularity in operation include (1) dovetailing work with other seasonal industries, (2) the 30-hour week, and (3) increasing transportation facilities. The first of these is not possible on a large scale and the last two would not raise the working time over the year as a whole, although they might affect the distribution of the demand from month to month.

"To overcome the seasonal character of demand storage facilities at the point of consumption must be provided. Proposals have been made to induce storage by the consumer by (1) offering summer discounts in mine prices; possible only if producers are allowed to agree on prices; (2) establishing a sliding seasonal wage scale; (3) establishing seasonal freight rates. Of these, the last offers greatest promise, although many practical difficulties would arise in applying the principle. Even supposing that the demand could be equalized, however, the excess of mine capacity over requirements would remain.

"There appears little hope of eliminating excess mine capacity and excess labor force as long as no check upon the opening of new mines or the expansion of old ones exists. The small extent of the deposits of anthracite in the United States has limited the development in the anthracite region and permitted demand to overtake mine capacity. The vast areal extent of bituminous coal lands sets no such limit and, as a result of recent high prices for coal, new development has proceeded on such a scale that the discordance between mine capacity and requirements has never been greater than at present."

Relations of Transportation to Coal Industry

A. G. Gutheim, manager of the public relations section of the car service division of the American Railway Association, spoke on the relations of transportation to the bituminous coal industry.

He contended that "So long as regulatory power exists to force coal production at the expense of other industries, similar power should exist to compel proper distribution of such production."

Four years of "rather harsh experience," he said, point to these indications:

"Our railroad facilities are probably adequate today to handle our necessary annual bituminous output produced with fair uniformity of rate throughout the year, and will certainly be adequate when post war rehabilitation of the properties is completed.

"Railroad facilities are not, and without great waste of investment never can be, adequate to handle currently our necessary bituminous coal production when obtained by weekly peaks of 13,000,000 tons and valleys of 7,500,000 tons in a twelve-month period, as has been the case the last two years.

"While the powers of the Interstate Commerce Commission are sufficient to force transportation for such extremes of production, the exercise of such powers necessarily involves discrimination against other traffic and should be avoided if at all possible.

"While our present railroad regulation can force production it can control distribution but slightly and prices not at all.

"Extreme variation in rates of production not only unduly burdens the transportation machine but invites further overdevelopment of mining, with the consequence of greater irregularity in miners' working time.

Advocates Compilation of Complete Statistics

"Provision should be made by additional legislation if necessary for the securing and compilation by proper governmental authority of current and complete statistics of production, distribution, consumption and stocks of bituminous coal.

"Let it be kept in mind that production, transportation, distribution and consumption are the four big factors in the bituminous coal industry and should be reasonably well balanced. Under ordinary conditions proper co-ordination of these four big factors is possible and the results should be better conditions of mining and railroading, lower costs of production and transportation and better prices and distribution to the consumers."

Mr. Gutheim was followed by David L. Wing, formerly of the Federal Trade Commission, who at considerable length reviewed the history of Federal attempts to collect data on cost of production in the bituminous coal industry. He outlined the nature of bituminous coal prices, the Fuel Administration price-fixing policy and program and described the course of the coal market after Federal regulation was lifted. After a brief résumé of the meager data available as to profits in the bituminous coal industry he stated as his conclusion that "the diversity of conditions found to exist between different fields in the same state is such as to militate against broad generalization."

George Cushing, managing director of the Wholesale Coal Trade Association, spoke on the selling of coal. He made a special plea for recognition of a difference between mining and merchandising of coal and for a separate profit for each. He said:

A Profit for Each Risk, Investment and Effort

"Personally I cannot see any reason to believe that a man who is a good producer must for that reason alone be also a good merchant. My experience with men leads me to think exactly the other way. Therefore, I say: Leave production to the producer and selling to the merchant, or every man to his trade. But the public holds that if a man gets a producer's profit he will want no merchant's profit; and thus the public will get its goods cheaper.

"We, here, are not studying popular psychology but general economics. It is one of the implied rules of general economics that for each distinct risk, investment and effort there should be a comparable compensation. If we follow that theory we must say that since the production effort is one and the wholesaling effort another, they constitute two businesses. Each, therefore, should be compensated commensurately even though both are housed in the same edifice and officered by the same men.

"The coal produced within no state is sold wholly in that state. It is probably true that on the average the market for coal of one state is in seven states. The task of the producer who wants to sell all of his own coal is to get enough tonnage to pay the expenses of a sales organization large enough to cover seven states.

"It is a matter of common knowledge that in the days of competition freed from Government control the selling margin ranged close to 7½c. per ton of mine-run coal. I venture to believe that there is not to exceed 75 companies in the United States which could, if they were so disposed, stand the financial strain of selling all of their own coal. All of the others depend in whole or in some part upon independent selling organizations.

"My second conclusion is that the narrow selling margins per ton and the limited tonnage available to each company have necessarily thrown the merchandising work into the hands of organizations wholly independent of the producer.

Some Results of Keen Competition

"As competition in the coal business became keen, the operators who control large tonnages came to set themselves solidly against independent merchants. In the fierce struggle for existence which ensued, the tendency was for the producers to advocate the destruction of the independent merchants and for the independent merchants to throw their support to the small competitor of the bigger operator. The result, of course, was to increase competition, which already was ruinous, and to reduce the already extremely narrow sales margin.

"It is apparent that the one thing which has stood in the way of a real merchandising program in coal has been the insistence of coal men in the past that the selling expense should be subtracted from the mine price rather than added to it. It has been my theory for years and still is that the coal industry will never develop a merchandising policy that is worthy the name until it separates production from wholesaling and attaches a commensurate margin to each.

"I am firmly convinced that we will never develop a proper export coal program without coal merchants. I am equally convinced that we will never develop coal merchants unless we set out studiously to create merchants by adding a merchandising price to the mine price."

Anthracite Mine Workers to Reopen Discussion with Operators—No Strike Likely

WHEN the operators on Dec. 23 declared their readiness to discuss scale inequalities in the contract of Sept. 2 the mine workers regarded that offer as a loophole and have accordingly thrust their whole corporate body in the breach. They still hold that by inequalities may be meant not slight oversights on the part of the board of arbitration but the whole body of the award. The chairman of the Anthracite Scale Committee, Thomas Kennedy, stated late on Dec. 28 that none of the demands of the hard-coal workers will be dropped and that committee on Dec. 28 instructed its sub-committee "to meet with representatives of the operators and endeavor to work out a basis of settlement that will be in general satisfactory to the anthracite mine workers."

The union asserts that as the industry is working steadily, demand being good, the operators can and ought to increase their employees' pay and it denies that because other industrials are accepting decreases and working irregularly the anthracite workers should be satisfied with their recently raised pay. Yet that same union claimed some time ago that because the bituminous mine workers did not work steadily their pay ought to be increased. This claim was conceded, but how about this one which is in direct variance with the other?

It is not thought, however, that there will be any strike. The operators will, perhaps with but one exception, feel satisfied that the public is so strongly set against wage advances that the operators will be backed to the limit in opposing them.

On Dec. 29 the Anthracite Board of Conciliation awarded an 8-hour day and a wage increase in the following terms:

"To the rate paid hoisting engineers in April, 1916, for a twelve-hour shift, shall be added $2 a day plus 17 per cent in the case of inside employment and $1.80 per day plus 17 per cent in the case of outside employment, and the new rates thus derived shall be paid for an eight-hour day.

"Provided, that if any rate established by this method for engineers changed from a twelve- to an eight-hour day shall be in excess of the rate now being paid at said colliery for similar hoisting service, such higher rate shall be without prejudice from the standpoint of the operators in the study of uniform rates by the Board of Conciliation."

J. D. A. Morrow and F. S. Peabody Named For International Commerce Board

AMERICAN participation in the International Chamber of Commerce became fully organized Jan. 3 with the appointment of an American committee composed of fifty-seven of the leading business men of the country. Members of the committee were appointed by Joseph H. Defrees, president of the Chamber of Commerce of the United States. They were chosen from the main divisions of the business of the country. A. C. Bedford, chairman of the board of the Standard Oil Company of New Jersey, is chairman.

The coal industry is represented by J. D. A. Morrow, vice president of the National Coal Association, Washington, D. C., and Frank S. Peabody, chairman of the Board of Directors of the Peabody Coal Co., Chicago, Ill.

The direct representative of the International Chamber in the United States is the American section. The section's headquarters at Washington is the point of contact between the membership in this country and the International headquarters in Paris.

The International Chamber was created at Paris last June. In the form of organization adopted each country holding membership has a national bureau as headquarters of its section, its national committee and an administrative commissioner of its own resident at Paris. The American section headquarters began operation in the fall with Lacey C. Zapf as secretary. The American administrative commissioner, Dr. Frederick P. Keppel, has taken up his duties at Paris.

Colorado Coal Operators Withdraw from National Coal Association

THE Colorado Coal Operators Association has withdrawn from membership in the National Coal Association, for the reason that "Colorado is remote from the Eastern territory" and the "activities of large coal interests back there control the policies of the national organization," according to D. W. Brown, vice president. Mr. Brown also is president of the Rocky Mountain Fuel Co.

The association of Colorado and New Mexico operators, it is understood, has come to the conclusion that "the service received was not sufficient to justify the expense incurred as the result of the membership relations."

Unofficial comment seems to be to the effect that the dissatisfaction of the Colorado operators centers in the inability of operators in the East to successfully establish the open-shop system of employment in mines. Colorado's largest mines are controlled by the Rockefeller interests and are operated on what union officials say amounts to an open-shop system.

One advantage that operators in Colorado may gain by severance of relations with the members in the National Coal Association is that they need not necessarily be bound by action taken in Eastern coal fields, where conditions are altogether different from those prevailing in Colorado.

It is understood that the local association hereafter will be conducted only as a traffic bureau and that Mr. Kerr, the secretary, has resigned to engage in private business.

The Colorado Retail Coal Dealers' Association withdrew from the National Retail Coal Merchants' Association about a year ago on similar grounds—that too often the "parent organization is concerned with problems that do not concern Colorado merchants."

Trade Commission Report Says Coal Industry Cost Accounting Is Chaotic

IN its annual report issued Monday, Dec. 27, the Federal Trade Commission reviews its work in collecting cost data on coal production and reviews the court litigation which has suspended such activity. The commission in the main body of its report defends the right to collect the information, declaring that the usefulness of such data is undeniable in meeting national problems. The legal division and the economic division, in separate parts of the report, also review the cost accounting work. The commission says that $35,000 was expended in the coal cost accounting surveys and work thereon.

Declaration is made that the cost reports are of value to the operator, miner, large industrial consumers of coal and household consumers, as they afford the public exact understanding of the coal situation as far as production costs and amounts realized by the companies are concerned.

The legal division bases its discussion of the cost reports on the authority given by various Congressional enactments and declares that cost accounting in the coal industry is chaotic. Explaining why it did not further contest the Maynard Coal suit the legal division says it was because the commission desired to test its right to require the cost reports in a suit which did not involve collateral issues as involved in the Maynard case, which was the argument that the commission's power had been transferred by the President to the Fuel Administration. The commission is now relying on the outcome of the suit instituted by steel companies involving its right to require reports.

New Federal Grand Jury Investigation to Begin Jan. 17; To Postpone Trial of Conspiracy Case

INVESTIGATION of the bituminous coal business by the present Federal Grand Jury probably will begin in Indianapolis Jan. 17. L. Ert Slack, special assistant U. S. Attorney in charge of the prosecution of the cases against the 125 miners and operators indicted last March on charges of conspiracy to violate the Lever Act, began issuing subpoenas Dec. 30 to witnesses who will be called to appear before the Grand Jury. The investigation, Mr. Slack says, will continue for two or three weeks. The investigation is to be practically as comprehensive as the one in which the special Grand Jury returned indictments last March.

Less time will be required for this second investigation, it is intimated, because the officials are better acquainted with the general situation in the coal fields and are therefore in a position to choose witnesses more intelligently. The investigation, as disclosed by U. S. Attorney Frederick Van Nuys at the hearing in open court regarding the relation of Attorney General Palmer to the pending cases, will be made with a view to returning indictments against additional defendants and probably against additional classes of defendants.

Mr. Slack says the investigation will cover the production of coal in 1920 as well as in 1919. It is expected also to include the operations of retail coal dealers and coal trade bureaus. The investigation of the production of coal in 1920 is expected to reveal matters of unusual interest inasmuch as all published information has shown that prices for coal reached their highest point last year, while at the same time the amount of coal produced was perhaps the largest except in 1918 in the history of the industry, according to men who are familiar with the case. Federal officials have intimated they believe the coal trade bureaus have been responsible for the uniformly high prices in the face of an increasing production.

The case against the 125 operators and miners is on the court docket for trial Jan. 10. Mr. Van Nuys has announced that a continuance will be asked at that time for an indefinite period pending the adjournment of the present Federal Grand Jury session. Arrangements made for the court proceedings on that date are that the defendants need not appear, but that they may be represented only by their counsel. Mr. Van Nuys says he does not know at this time just when the cases can come to trial inasmuch as the length of time the Grand Jury will be in session is uncertain. The jury convened again Jan. 3 after a holiday recess of eleven days. Because of the large number of exceptionally important cases before the jury, a part report is to be made to the court about Jan. 8, according to Mr. Van Nuys.

H. Foster Bain Is Appointed Head Of Bureau of Mines

H. FOSTER BAIN, of California, has been nominated by the President to be director of the U. S. Bureau of Mines. He succeeds Dr. F. G. Cottrell, who leaves the bureau to become the head of the division of chemistry and chemical technology of the National Research Council. During the war Mr. Bain was assistant director of the Bureau of Mines and takes over the direction of the bureau with an intimate knowledge of its functions.

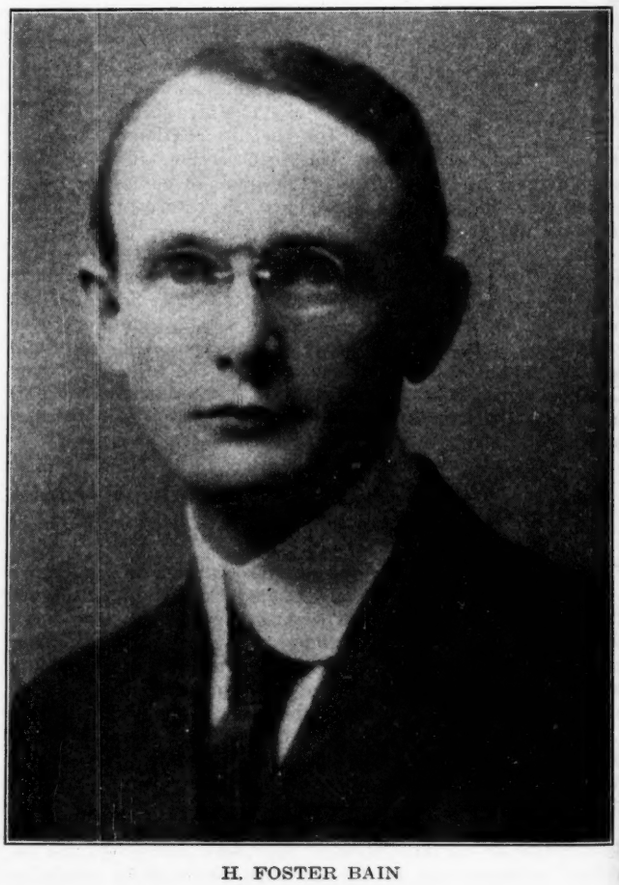
Mr. Bain was educated and trained as a geologist and mining engineer. He was one of Herbert Hoover's assistants in London in Belgian relief work during the war. Before that he was editor of the *Mining and Scientific Press*, of San Francisco, Cal., and later was editor of the *Mining Magazine*, of London, England. He made some important mining investigations in south and central Africa and later undertook similar investigations in China. At one time he was a mine operator in Colorado and once was connected with the U. S. Geological Survey. Subsequently he was the first director of the Geological Survey of Illinois.

For a time during the war Mr. Bain was assistant director of the U. S. Bureau of Mines, following up production and manufacture of metal products, explosives and other chemical substances for war purposes. At the close of the war he returned to private life.

Mr. Bain was born at Seymour, Indiana. After being graduated from Moore's Hill College, Indiana, in 1890, he spent two years at Johns Hopkins University and later received his doctor's degree from the University of Chicago. He has been for many years a prominent and active member of the American Institute of Mining and Metallurgical Engineers, the Mining and Metallurgical Society of America, and the American Mining Congress.

The first thing Mr. Bain did after taking his doctor's degree was to obtain employment as a shift boss in a mine with the idea of gaining first-hand experience in that phase of practical operation. He took charge of a gold-silver operation known as the Franklin mine, in Clear Creek County, Colorado.

In addition to Mr. Bain's contact with English mining affairs during his residence in England as editor of the *Mining Magazine*, he has engaged in consulting work in the Rand, the Belgian Congo, and other mining regions of Africa. He also has had considerable experience in the Far East. During the two-year trip from which he has just returned he made mining examinations in ten Oriental countries.



H. FOSTER BAIN

F. T. Miller Blamed for Making a Fiasco of Calder Coal Investigation

WASHINGTON CORRESPONDENCE

ANYTHING but a favorable impression has been created in the minds of business men and many students of the coal situation by the tactics of the Calder committee. Apparently there is widespread resentment on account of the methods of the committee, which are held not to be those of a tribunal but those of the muckraker.

Most of the blame for the committee's methods of procedure is laid at the door of Franklin T. Miller, the committee's adviser. Senators Calder, Edge and Kenyon, the active members of the committee, are generally known to be above many of the proceedings which have been conducted in the name of the committee. It is well known that the demands on the time of Senators are such as to preclude any great amount of attention to the details of such an investigation. In several instances, however, the principals to the investigation have not leaned over backward to be entirely fair.

If ever a fact was made clear, it was that the National Coal Association made no effort to influence improperly the figures of the U. S. Geological Survey. It is so evident that the Geological Survey did only the sensible thing in the course it took with the Illinois figures that it is hard to understand how Senator Calder could have stood on the floor of the Senate—especially after having had the cordial talk with Dr. George Otis Smith, the director of the U. S. Geological Survey, in which the correctness of the relationship was thoroughly explained—and referred to the influencing of the Survey's figures without having said something to offset the widely published erroneous deductions at first made by the committee.

CONSTRUCTIVE RESULTS CONSIDERED UNLIKELY

While the public has come to take for granted that a certain amount of baiting of big business is a natural complement of this type of investigation, it is apparent to most of those interested that nothing particularly constructive is likely to come out of efforts to find out just who profited during the high prices of coal or who were the advisers of the Interstate Commerce Commission.

The efforts to discredit the National Coal Association and the unjustifiable thrusts at Colonel Wentz are examples of some of the apparent objectives of the committee. The failure to get above that type of work and delve into broad, constructive phases of the situation is causing disappointment. There is a failure to see the forest because of the trees.

It is apparent that the committee's investigation has aroused again the desire to provide definite machinery for the handling of any future coal shortage. Despite the fact that the average price for coal increased less than did the price of most other commodities, the public gives evidence of declining to think of high coal prices as it does of other costs. In the face of that widespread demand it is freely predicted that some definite machinery will be provided to handle such situations as arose during the present coal year.

SPECULATION AS TO LEGISLATION TO BE PROPOSED

The Calder committee has not made public any of its ideas as to the legislation it expects to recommend. It is expected that at least two amendments to the Transportation Act will be proposed. One would limit the discretionary powers of the Interstate Commerce Commission, while the other would prevent the dilution of car supply by the entry of wagon mines into the field during an emergency.

Senator Frelinghuysen's coal commissioner bill seems more likely to be the basis of legislation than any bill which results from the Calder investigation. It is believed that some legislation is certain to be enacted to provide for any period of emergency in coal. It is expected that such a bill would place in the hands of the President the power to fix prices during the period that the government attempts to regulate distribution. It would not be surprising if provision should be made for sweeping commandeering powers during such an emergency, which would enable the government to take control of coal at the mines and handle it in a way that would greatly simplify the regulation of wholesalers and retailers' margins. The general impression among legislators seems to be that the economic situation now is such that competition can be relied upon to regulate coal prices for many a day to come, unless there be labor troubles, either in the mines or on the railroads, which would retard production for an extended period. The increasing possibility of such trouble is recognized and is one of the reasons why it is believed that machinery should be provided to regulate coal during any period when the supply is greatly less than the needs.

Judge McGee's suggestion that the Calder committee recommend a hard and fast type of contract probably will not be enacted into law, as members of Congress realize that operators would not enter into contracts not to their liking, thereby adding materially to the instability of the industry.

To date, none of the disclosures of the committee is regarded as damaging to the National Coal Association. In fact, the raid on its offices bids fair to redound greatly to the benefit of the association. The spectacular way in which the representatives of the committee swooped down upon the coal association's office, the carting away in the middle of the night of many of the association's papers, the long delay in listing these papers and in receipting for them are very generally regarded as unfair tactics, if not in direct violation of constitutional rights.

Some further disclosures as to spectacular prices charged by individual members may be expected. As it will not be difficult to demonstrate that such prices covered an insignificant portion of the tonnage, nothing of moment is likely to be revealed.

Calder Committee Holds Private Hearings

A NEW policy has been put into effect by the Calder committee of the U. S. Senate. Instead of proclaiming its ideas on coal in advance to the world, the committee is now holding executive sessions and receiving information privately. Dr. H. A. Garfield saw Senator Calder on Thursday, following which Mr. Calder said the anthracite situation and the activities of the Department of Justice had been discussed. Dr. Garfield may testify in public later. It is also announced by Senator Calder that the anthracite price situation will be investigated and the hearings may be prolonged. D. W. Simms, formerly special assistant to the Attorney General, told the committee of his disagreement with Attorney General Palmer in the conduct of the case against miners and operators in Indianapolis, and Mr. Palmer will be requested to explain his department's attitude in the matter of "coal profiteering."

A. W. RILEY, SPECIAL ASSISTANT to the Attorney General in coal cases, is reviewing the testimony before the Calder committee in regard to profiteering and any evidence that may be made the basis for indictments or prosecutions will be placed before Assistant Attorney General Nebeker, in charge of coal cases. Secretary Baker said he did not believe army coal purchases had enabled dealers to make $8,000,000 profit. The War Secretary explained that because of the high prices the department had not placed its annual contracts for coal but when a pressing necessity for coal arose the army was forced to go into the open market and buy at spot prices. The army, unlike the navy, did not resort to commandeering orders, he said, because it was felt that such action would place the burden of payment upon the general public.

Foreign Markets and Export News

Japanese Market Eases; Depression of Exchange

Japan's coal market, according to Wheelock & Co.'s market report issued at Shanghai, Nov. 18, is somewhat easier but not enough to compensate for the recent fall in exchange. Since the preceding report negotiations have been going on with regard to next year's contracts but the continual downward trend of exchange during the past few weeks has made it difficult for sellers to fix a price forward which will cover the whole of the year, but in any case it is expected that something definite will have to be settled during the course of the next few days.

No change is reported in the Fushun market.

In the Kaiping market there is nothing new of general interest to report but the question of next year's prices may be touched upon in the next report.

Coal prices are quoted as follows:

	Taels per Ton ex-Wharf
JAPAN COAL	
Miike Lump, Miike Small, Miike Dust	Contracted for
Kishima Lump	15.00
Shakano Lump	13.00
Arate Lump	12.00
Shimoyamada Kirigomi	11.00
Shin Shakano Kirigomi	11.00
Yoshinotani No. 1 Lump	12.00
Yoshinotani No. 2 Lump	10.00
Ochi Lump	12.00
KAIPING COAL	
No. 2 Lump	13.50
Washed Nuts	13.50
Washed Slack	10.50
No. 1 Slack	9.00
No. 2 Slack	8.50
FUSHUN COAL	
Dust	11.00
Dust Kirigomi	Contracted for
Dust Lump	No stock

Netherlands Coal Imports Fall Below War Average

Imports of coal into the Netherlands for the first nine months of the current year and last year, according to Consul General G. E. Anderson, Rotterdam, were as follows:

Counties of Origin	Jan.–Sept. 1919 *Metric Tons*	Jan.–Sept. 1920 *Metric Tons*
Germany	650,631	1,105,330
United States	362,272	662,280
Great Britain	312,816	193,165
Canada	4	182,199
Belgium	1,338,854	23,426
Other	90	24,579
Total	2,664,697	2,190,979

Of these imports there was exported in bunker coal for departing ships a total of 62,830 metric tons, of which 11,831 went to shipping for Norway, 8,699 to Great Britain, 8,695 to Sweden, and 8,631 to American shipping. A total of 337,860 tons went to bunker Netherlands ships. This makes 400,690 metric tons for bunker supplies out of the 2,190,979 tons imported, leaving a total of 1,790,289 tons.

At this rate imports of coal into the Netherlands available for domestic consumption will amount to not more than 2,400,000 tons during the current year. To this amount should be added 3,400,000 tons as the estimated output of the Netherlands mines, making a total of 5,800,000 metric tons of coal available for domestic consumption. This amount compares with 6,451,567 tons in 1919, 4,224,789 tons in 1918, 5,390,883 tons in 1917, 8,786,000 tons in 1916, 9,537,000 tons in 1915, 9,206,000 tons in 1914, and 9,921,000 tons in 1913. Unless, therefore, the rate of import of coal into the country in the last quarter of the current year is greatly increased over the rate for the first nine months, the total supply available for Dutch railways and factories and for other domestic uses will fall about 15 per cent below the average for the years 1915-1919 inclusive.

It should be noted that the coal now available for consumption in the Netherlands is of comparatively poor quality, especially that taken from the Dutch mines. The quality of the coal sold for bunkers in Dutch ports at the present time—usually a mixture of Dutch and imported fuel—is such as to have a marked influence upon the voyage of vessels from these ports.

To the figures given reporting the amount of fuel available for local use in the Netherlands should be added a fair allowance for lignite and peat, but the amount of fuel thus available is not as large as usual.

Foreign Freight Market Better; Rates Easier

The demand for steamers to carry coal to European ports, according to W. W. Battie & Co.'s coal trade freight report, is decidedly better than it was a week ago although freight rates are a trifle easier and during this period a number of steamers have been chartered at the rates quoted below:

To West Coast South American ports, rates are a trifle firmer and to West Indian ports are slightly easier to some destinations. While the charter of a few boats both to South American and West Indian ports is reported, orders are still limited to both destinations.

	Dec. 13, 1920	Dec. 27, 1920	Tons Discharge Daily
Malmo	$8.00/$8.50	$6.50/$7.00	1,000
Copenhagen	8.00/ 8.50	6.50/ 7.00	1,000
Stockholm	8.00/ 8.50	7.00/ 7.50	800
Gothenburg	8.00/ 8.50	6.50/ 7.00	1,000
Antwerp/Rotterdam	5.00/ 5.50	4.25/ 4.75	1,000
Hamburg	Aboht 6.50	5.25/ 5.50	1,000
Fr. Atlantic ex. Rouen	5.25/ 5.50	5.00/ 5.25	700
Lisbon	.....	5.00/ 5.25	700
Algiers	About 7.00	About 6.00	800
West Italy	About 7.00	About 6.00	1,000
Marseilles	About 7.00	About 6.00	1,000
Piraeus	9.00/ 9.50	About 7.00	1,000
Trieste/Venice	About 9.50	About 7.00	1,000
Port Said	8.50/ 9.00	About 6.50	1,000
Constantinople	About 10.50	About 7.50	500
Gibraltar	6.50/ 7.00	5.25/ 5.50	1,000
Teneriffe	.....	5.00/ 5.50	500
Pernambuco	About 7.50	About 6.00	500
Bahia	About 7.50	About 6.00	500
Rio	6.50/ 7.00	5.25/ 5.75	750
Santos	7.00/ 7.50	5.50/ 6.00	500
Buenos Aires or Montevideo or La Plata	6.50/ 7.00	5.25/ 5.75	500
Para	About 7.50	About 6.00	500
Rosario	7.00/ 7.50	5.50/ 6.00	750
To Nitrate Range	About 6.25	About 6.00	500
Havana	About 4.00	3.50/ 4.00	500
Sagua or Cardenas	About 5.25	4.75/ 5.00	500
Cienfuegos	About 5.25	4.50/ 4.75	500
Caibarien	About 5.00	Aboht 4.75	300
Guantanamo	5.00/ 5.25	4.50/ 4.75	500
Manzanillo	About 6.00	About 5.25	300
Bermuda	About 5.00	About 4.00	300
Bermuda p. c. and dis. free		p. c. and dis. free	
Kingston	About 5.25	4.00/ 4.25	400
Barbados	About 5.50	4.50/ 4.75	500
St. Lucia	About 5.50	4.50/ 4.75	500
Santiago	About 5.00	4.50/ 4.75	500
Port of Spain, Trin	About 5.50	4.50/ 5.00	500
Curacao (free p.c.)	About 5.25	About 4.50	500
St. Thomas	About 5.00	About 4.25	500

All above rates are gross from charter.

Coal Production Costs and Profits in Great Britain

Costs of production, profits and other statistics of the British coal industry for the first nine months of 1920 are given in the following table, recently compiled by the Mines Department:

	Three Months Ended Sept. 30, 1920 Gross Tons		Three Months Ended June 30, 1920 Gross Tons		Three Months Ended March 31, 1920 Gross Tons	
Output:						
Tonnage raised	59,222,000		58,144,000		62,057,000	
Mine consumption and miners' coal	5,969,352		5,883,268		6,376,122	
Tonnage disposable commercially	53,252,648*		52,260,732		55,680,878	
	Amount	Per Ton Disposable Commercially	Amount	Per Ton Disposable Commercially	Amount	Per Ton Disposable Commercially
Costs of Production:						
Wages	£ 69,908,316	26s. 3.06d.	£ 66,570,490	25s. 5.72d.	£ 63,220,756	22s. 8.50d.¶
Stores and timber	£ 14,563,512	5s. 5.64d.	£ 13,638,605	5s. 2.63d.	£ 12,758,171	4s. 6.99d.
Other costs †	£ 6,689,601	2s. 6.15d.	£ 6,250,094	2s. 4.70d.	£ 4,569,566	1s. 7.70d.
Royalties	£ 1,690,734	0s. 7.62d.	£ 1,662,763	0s. 7.64d.	£ 1,747,653	0s. 7.53d.
Total costs	£ 92,852,163	34s. 10.47d.	£ 88,121,952	33s. 8.69d.	£ 82,296,146	29s. 6.72d.
Deduct proceeds of miners' coal‡	£ 381,274	0s. 1.72d.‡	£ 371,957	0s. 1.7d. ‡	£ 413,307	0s. 1.78d. ‡
Net costs	£ 92,470,889	34s. 8.75d.	£ 87,749,995	33s. 6.98d.	£ 81,882,839	29s. 4.94d.
Proceeds:						
Commercial disposals	£ 105,413,807	39s. 7.08d.	£ 95,658,036	36s. 7.30d.§	£ 96,260,541	34s. 6.91d.
Balance: ‖						
Debits						
Credits	£ 2,942,918	4s. 10.33d.‡	£ 7,908,041	3s. 0.32d. ‖	£ 14,377,702	5s. 1.97d.
Number of workmen employed	1,186,946		1,178,614		1,168,659	
Tonnage raised per person employed	49.89		49.33		53.10	
Earnings per person employed	£ 58 17s. 10d.		£ 56 9s. 8d.		£ 54 1s. 11d.	

* Of the 53,252,648 tons disposed of commercially, 9,437,465 tons were shipped for export and foreign bunkers, mainly from South Wales and Monmouthshire, Northumberland and Durham.

† Management, salaries, insurance, repairs, office, selling and general expenses, etc.

‡ The proceeds of miners' coal, so far as it is supplied at special prices, are treated as a reduction of the cost of producing the coal disposed of commercially, and the deductions in the "per ton" columns have been calculated by dividing the proceeds of miners' coal by the tonnage disposable commercially.

§ On May 12, 1920, the price of coal sold for home consumption was raised as follows: (*a*) Coal for domestic use by 14s. 2 d. per ton; (*b*) Coal for industrial use by 4s. 2d. per ton.

‖ Out of the balance shown provision has to be made for depreciation, interest on debentures and other loans; capital adjustments under the Finance Acts and the profit to which the coal owners are entitled to under the Coal Mines (Emergency) Act, 1920.

¶ An advance in wages operated from March 12, 1920.

Fuel Control Cost U. S. $4,824,681

FUEL control during the war cost the Federal Government $4,824,681, according to the final report of the business manager of the Fuel Administration, made public in Washington, Wednesday, Dec. 29. This sum represents all expenditures, national and state, by the Fuel Administration from its organization in September, 1917, to June 30, 1919, when the administration virtually was disbanded.

Appropriations made for fuel control totaled $5,813,818 and Lawrence Mitchell, assistant business manager, who prepared the report, said there was a balance of $909,137 on hand on June 30 last year.

Expenditures by the headquarters in Washington totaled $2,706,479 and by the states $1,948,618. By far the largest sum was spent in New York State, the total being $212,012, while in New York City $51,675 was spent. Pennsylvania was the second state in the list of expenditures with $84,025, while Illinois was third with $66,849. In the New England States as a whole the cost was $99,812.

PRODUCTION OF COAL AT 192 mines in Indiana during the week ended Dec. 25 is reported as 449,264 net tons, as compared with 638,314 net tons the week preceding. These mines operated 58.52 per cent of full time, with lack of market responsible for 21.68 per cent of time lost. Of the remaining causes of lost time mine disability was responsible for 8.70 per cent, labor trouble for 6.66 per cent and car shortage for 3.82 per cent.

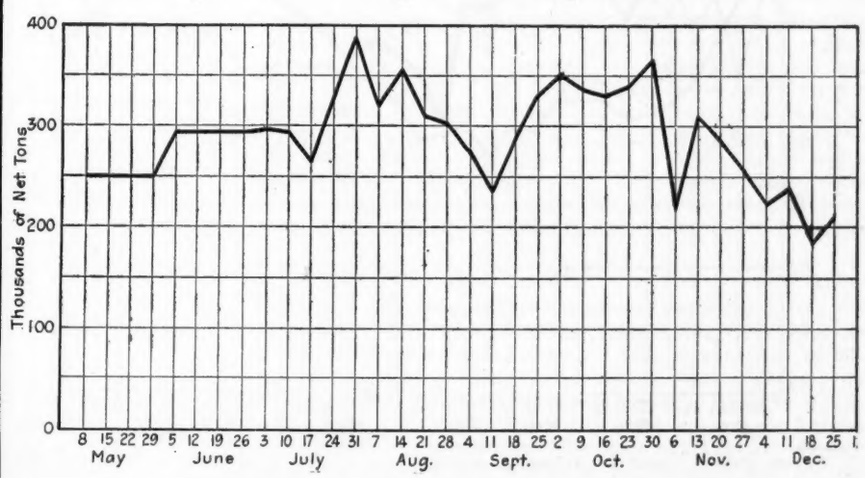
INCLUDED IN SUPPLEMENTAL ESTIMATES of appropriations required by the Bureau of Immigration, Department of Labor, during the fiscal year ending June 30, 1921, referred to the Committee of Appropriations of the House of Representatives Dec. 21, was one for $130,000 to be expended on the immigrant station at Ellis Island, divided as follows: For necessary alterations in power plant for substitution of oil for coal, and necessary storage tanks, $100,000; extension of coal hoist and furnishing new runway and handling apparatus (substitute estimate), $30,000.

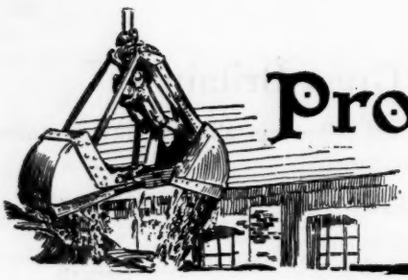
Export Dumpings by Ports

(NET TONS)

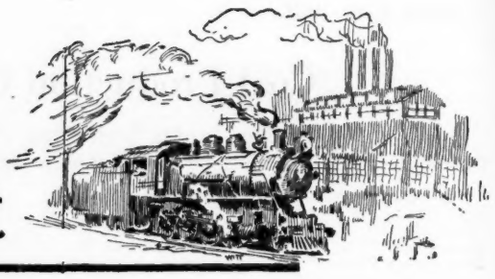
	Week Ended Dec. 25	Dec. 18
Philadelphia ..	7,000	45,000
Baltimore	32,000	59,000
Norfolk	204,000	189,000
Charleston	3,000	.....
Total	246,000	293,000

Export Coal Dumped at Hampton Roads





Production and the Market



Weekly Review

PRODUCTION of bituminous coal during the holidays continued at a high rate. Output in Christmas week was 9,725,000 tons, an average of nearly 2,000,000 tons a day for the five-day week, and New Year's week output approximated 8,000,000 tons, or at a rate of about 1,600,000 tons per working day. As for the last few weeks, very little spot coal has been moving either at home or for foreign account and the coal that has been shipped has been in fulfillment of contracts.

There is no interest in the spot market and prices are very weak, quotations ranging as much as a dollar below the free coal market of last April, immediately after the lifting of Government control of prices. Consumers with stocks of coal on hand, accumulated during the panic of last year and at high prices, are busy this week writing off losses in view of the contraction in value of the same coal.

Advisable to Place Small Contracts Now

Prices, in place of declining by 25c. jumps, have so nearly reached bottom that variations—all downward—are reported in 5, 10 and 15c. intervals. So little free coal is being sold today that the spot market is not a true index of the basis upon which large-quantity business can be closed. For this reason now is an excellent time for consumers with modest tonnage requirements to get a cheap supply.

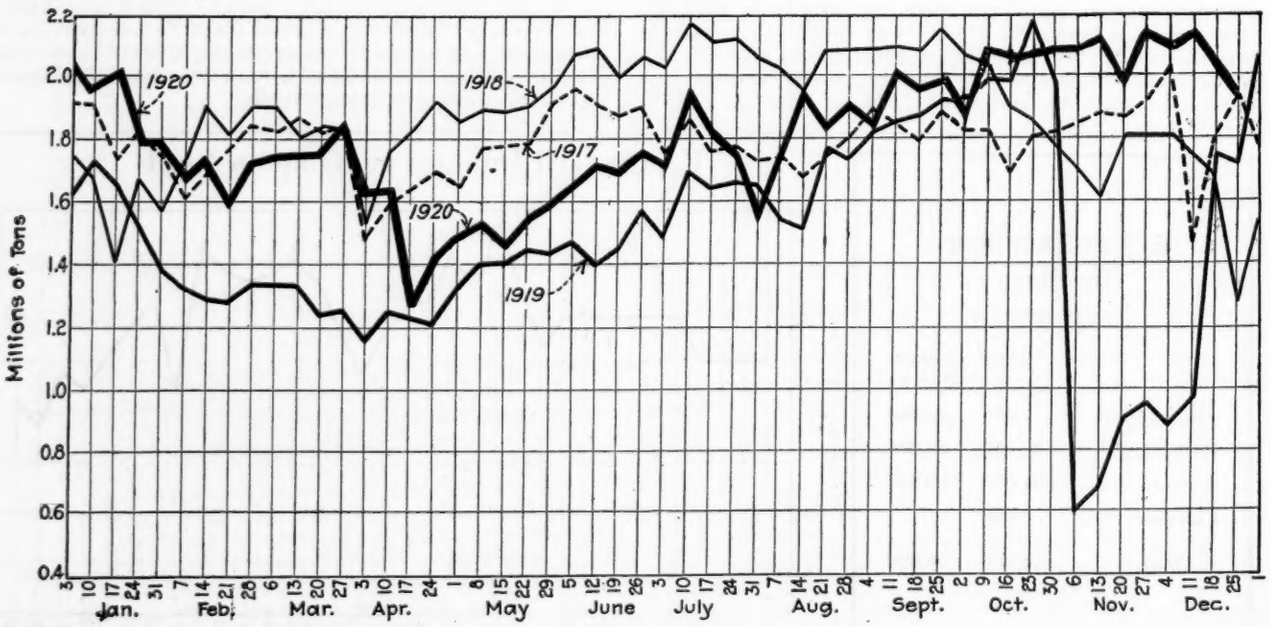
Despite the short week there were large additions to the list of mines reporting operations closed because of lack of market in the last half of December. That this list will continue to grow and that "no market" will shortly be the chief factor limiting output is made evident by reports of extensions of the industrial shutdown for the holiday period to include January. This is particularly true in the Middle West and in New England.

From now on interest will center on the contract market for next year, but it is not likely that consumers will be as much interested as the operators and shippers. The next sixty days will represent the most favorable period for buyers to close contracts—of course, with provisions for wage revision downward. Contracts in the East have been closed in the last two weeks at prices 25c. below those for the same coals entered into Dec. 1. The outlook now is for contract prices to be below those of a year ago, but there is no assurance that conditions will not change by April 1.

One factor that will permit the continuance of present or lower prices from some districts, as central Pennsylvania, is the abolition of wage bonuses to mine labor. This practice was more or less generally indulged in when prices were high, but it has been announced that it has been discontinued as of Jan. 1.

Production of anthracite continues good despite the

Daily Average Production of Bituminous Coal*



*From weekly report of Geological Survey.

holidays. There is evidence of a break in the independent market, as continued mild weather has decreased consumption and production has been maintained at a high rate. There have been no changes in the company circular prices on prepared sizes and none is expected this coal year. It is reported that for the first time since the spring of 1919, Western agents of the anthracite interests are on the road and actively seeking business in the Middle West, particularly in Chicago.

BITUMINOUS

Holiday idleness cut the production for the week ended Dec. 25. According to the Geological Survey the output was 9,725,000 net tons, a decline of 2,430,000 tons from the figure for the preceding week. Christmas week was a five-day working period and the daily average of 1,945,000 tons mined shows that a high rate is being maintained. Production for the last week of the year was even further curtailed, the output being approximately 8,000,000 tons as indicated by preliminary reports of loadings. Many mines were closed down entirely from Christmas until after New Year's and some of them are in no hurry to resume business, as the present market holds no inducement for pushing production.

Car Supply and Load Movement Are Good

Good car supply featured operating conditions during the week ended Dec. 25. Of course the short week was a factor in holding down any losses from car shortage, even in some sections of the Middle Appalachian region where losses have been appearing lately. Movement of loads also was very satisfactory, as railroads experienced a considerable decline in general freight due to the industrial inactivity.

Labor shortage losses are at a minimum. So many industries have either suspended operations entirely or are going on short hours with reduced wages that former miners and unskilled labor are turning to the mines for employment. It is only a question of a short time until the saturation point will be reached. Already many applicants for work are being turned away from some of the Illinois and Indiana operations. Central Pennsylvania producers have abrogated the bonus system which was instituted last summer as a stimulus to production.

Low Spot Prices Force Out Produces of Poor Coal

Spot prices have dropped to and in some cases have even gone below production costs. This has forced the small, high-cost operations to close and means that consumers will soon find only "quality coal" on the market, as these temporary operations produced the poorest grades that were thrown on the market during the period of high prices.

Shipments are largely confined to contracts and only the best grades are finding ready disposition on the spot market. Reserve stocks, purchased during the "shortage panic," are being drawn on heavily and what little spot coal is purchased is on a day-to-day consumption basis only. Overseas demand is in the same category—little new business is being done for immediate delivery and charter rates as low as $4.75 were reported last week for Rotterdam and French Atlantic ports.

The following table shows the trend in the spot steam market (mine run basis, net tons, f.o.b. mines):

	Nov., 1919*	May, 1920	Aug. 5, 1920	Dec. 23, 1920	Dec. 30, 1920	Jan. 6, 1921†
Pittsburgh steam	$2.35	$4.00	$10.00	$3.25	$2.75	*$2.60*
Pittsburgh screened gas	2.35	4.50	12.00	3.75	3.25	*3.15*
Hocking	2.50	4.75	9.00	3.00	2.50	2.50
Franklin, Ill.	2.35	3.75	6.50	3.40	3.40	*3.00*
Indiana 4th vein	2.35	3.40	7.50	3.25	3.25	*2.75*
Eastern Ohio, No. 8	2.35	4.50	10.50	3.40	3.00	*2.75*
Fairmont	2.50	6.75	13.50	3.00	2.75	*2.40*
Kanawha	2.60	6.75	14.00	3.50	3.00	*2.80*
S. E. Kentucky	3.00	6.00	10.50	4.00	3.40	*2.90*
Western Kentucky	2.35	3.50	5.25	3.75	2.75	*2.60*
Clearfield	2.95	6.25	12.00	3.75	3.75	*3.25*
Cambria and Somerset	2.95	6.75	13.50	4.75	4.65	*4.35*
New River	2.70	6.50	14.00	5.00	4.75	*4.50*
Pocahontas	2.35					

*Government prices.
†Advance over the previous week shown in **heavy type**, declines in *italics*.

Estimates of Production

From the Weekly Report of the Geological Survey
(Net Tons)

BITUMINOUS COAL

Total bituminous, including coal coked

	1920 Week	1920 Calendar Year to Date	1919 a Week	1919 a Calendar Year to Date
Dec. 11	12,853,000	525,371,000	5,800,000	431,091,000
Daily average	2,142,000	1,797,000	967,000	1,469,000
Dec. 18d	12,155,000	537,553,000	10,431,000	441,522,000
Daily average	2,026,000	1,799,000	1,738,000	1,470,000
Dec. 25d	9,725,000	547,278,000	8,621,000	450,143,000
Daily average	1,945,000	1,804,000	1,724,000	1,479,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (d) Subject to revision.

ANTHRACITE

	1920 Week	1920 Coal Year to Date	1919 a Week	1919 a Coal Year, to Date
Dec. 11	1,915,000	62,939,000	2,120,000	65,594,000
Dec. 18	1,979,000	64,918,000	1,727,000	67,321,000
Dec. 25	1,626,000	66,544,000	1,856,000	69,177,000

(a) Less 2 days' production during first week of April, to equalize number of working days covered for the two years.

BEEHIVE COKE

United States Total

Week Ended Dec. 25c 1920	Dec. 18c 1920	Dec. 27 1919	1920 to Date	1919a to Date
280,000	333,000	323,000	20,554,000	19,349,000

(a) Less one day's production during New Year's week to equalize number of days covered for the two years. (c) Subject to revision.

Tidewater movement during Christmas week amounted to 645,000 net tons, according to the Geological Survey, a decline when compared with the preceding week's movement of some three hundred thousand tons. The coal moving to tide was destined as follows:

Destination	New York	Philadelphia	Baltimore	Hampton Roads	Charleston	Total
Coastwise to New England	33,000	12,000	13,000	73,000	.....	131,000
Exports	.....	7,000	32,000	204,000	3,000	246,000
Bunker	59,000	3,000	9,000	46,000	.....	117,000
Inside Capes	.....	26,000	13,000	6,000	.....	45,000
Other tonnage	101,000	.....	.....	4,000	1,000	106,000
Totals	193,000	48,000	67,000	333,000	4,000	645 000

All-rail New England shipments via the five-rail gateways were 4,633 cars during the week ended Dec. 25, or 589 cars less than the movement during the preceding week.

ANTHRACITE

Hard-coal production reflected the shorter working time with an output of 1,626,000 net tons, as reported by the Geological Survey. Distribution of anthracite is progressing satisfactorily and while supplies are not heavy enough to permit any general stocking, all communities are now well taken care of. The Middle West is no longer apprehensive of a shortage, as receipts have been materially increased of late. All domestic sizes at company schedules find ready markets but some price concessions are necessary to move independent coals. The latter's steam product is being moved with difficulty at prices that in some instances are lower than the company figures.

COKE

Beehive coke production was greatly curtailed during the week ended Dec. 25, 280,000 net tons being the figure reported by the Geological Survey. This is a decline of 53,000 tons, compared with the preceding week. There is no demand for spot furnace coke and scarcely any for foundry, while consumers are taking no interest in contract figures. Connellsville quotations on the spot market are $5.25@$5.50 for furnace and $7@$7.50 for foundry per net ton at ovens.

Reports From the Market Centers

New England

BOSTON

No Improvement in Demand — Spot Sales Infrequent — Forced Sales Lower Spot Prices — Tidewater Movement Is Light — Anthracite Domestic Sizes Already in Better Supply.

Bituminous—The trade feels no appreciable change this week in the steam market. None of New England's industries has shown any improvement that would hold out the least encouragement. The newsprint manufacturers are a possible exception to this, but even in their case current consumption is being amply taken care of by deliveries on old contracts.

Receipts at the Hudson River gateways are being maintained remarkably, considering all the adverse conditions. It is convincing evidence that a larger proportion of daily shipments through the season were on yearly contracts than was generally assumed to be the case. Confiscations by railroads have practically ceased and it is to be hoped that what has proved to be a source of irritation has now been removed for a long time to come. Spot sales are much restricted. Pressure to move coal standing at the Philadelphia piers and the relatively low prices on coal carrying demurrage charges has some bearing on the lack of interest in spot deliveries all-rail but no very considerable tonnage is involved.

There have been vague rumors of a few buyers of quality grades from central Pennsylvania being urged to renew last year's contracts but these we have not yet been able to verify. Among some operating interests, there is a disposition to argue that spring opening figures should be no lower than present invoice prices where contracts are still in force, the ground being that it is not open to producers to agitate any change downward in the present wage scale. This, however, would seem hardly a ripe time to urge any such doctrine upon consumers in this territory who have stocks almost as large as those of the fall of 1918.

The holiday week has disclosed no price movement worth mentioning. In a few instances, there have been forced sales where figures as low as $2.35@$2.50 per net ton at the mines have been realized. Operators are turning and twisting with what contract business they have open to ship in the effort to avoid entering the market with spot coal until later in January, hoping inquiry will improve if only very slightly.

Tidewater movement is light. At Philadelphia there has been a small increase coastwise, but at New York there are reports of cargoes "on consignment" and at Hampton Roads dumpings have decreased notably.

Current prices on bituminous at wholesale range about as follows:

	Clearfield	Cambrias and Somersets
F.o.b. mines, per net ton	$2.50@4.00	$3.25@5.40
F.o.b. Philadelphia, per gross ton	5.45@7 15	6.29@8.70
F.o.b. New York, per gross ton	5.90@7.60	6.75@9.10

Pocahontas and New River are quoted $7.40@$8 per gross ton f.o.b. Norfolk and Newport News and at $10.75@$11 alongside Boston, Providence, or Portland.

Anthracite—Domestic sizes are now fast improving in supply. It is not so much that production has increased as the perceptible relaxing in demand both wholesale and retail. January figures are certain to show increasing movement to New England both by rail and water.

The Massachusetts Fuel Administrator, E. C. Hultman has publicly warned retail dealers in communities where prices are not justified to reduce these within a reasonable compass.

Tidewater—East

NEW YORK

Anthracite Situation Improving Slowly —Independent Quotations Dropping— Steam Grades Slump—Dull Bituminous Market—Movement Is Slow—Quotations Drop.

Anthracite—Conditions continue to improve. Supply is rapidly nearing normal. Demand remains strong but not urgent. A few weeks more of favorable temperatures will put the local market on a substantial basis. Most shippers believe the crisis is past and do not look for further trouble this winter unless transportation difficulties interfere with shipments. Weather conditions continue to play an important rôle in the situation.

The situation in the surrounding towns shows considerable improvement. Coal is badly needed to fill bins but no one is in want. The companies are distributing their tonnages as evenly as possible and are re-entering unfilled orders on their books. Shippers of independent coals are facing many cancellations because of the falling prices. Quotations for the larger coals are slightly below last week's figures—around $11—and there are some of the trade who venture the opinion that within the next 6 or 8 weeks independent coals will be offered at concessions from the company schedules.

Pea coal is the longest of the domestic sizes and hard to move. Independent product is quoted $8.50@$9 by some shippers. The bottom appears to have dropped out of the steam market so far as the independent coals are concerned. All sizes are long and quotations below the company schedules are heard. Buckwheat is $3.25@$3.75; rice, $2@$3, and barley as low as 75c.

Bituminous—The year ended with the market quiet. Local docks held heavy tonnages and there was said to be many cars on demurrage. The threatened strike of the marine workers did not have the usual effect of stimulating trade and boat owners said they saw no hurry on the part of consumers to lay in extra stocks.

Many of the smaller openings in Clearfield and other fields are closed down, the owners not being willing to sell their coal at prices, in some cases, below the cost of mining. Others are endeavoring to continue operations by abolishing the payment of bonuses to their workmen. These conditions are proving a benefit to the larger companies, giving them more help and a larger car supply. The line trade is active. Dealers are grasping the present opportunity to fill their bins.

In this harbor empty boats are numerous, while loaded boats are hard to move even at concessions. While it was reported that local firms had been quoted good coals f.o.b. Baltimore docks at around $5, quotations here were somewhat better. Local Tidewater prices f.o.b. piers were on the basis of the mine quotations, which ran about as follows:

Pool 9, $3.50@$4; Pool 10, $3.25@$3.75; Pool 11, $2.50@$3; Pool 34, around $3, and Pool 44, Sewickley vein, $2.50@$2.75. Pools 1 and 2, New River and Pocahontas coals, were fairly strong, with quotations ranging $4.75@$5.

PHILADELPHIA

Anthracite Demand Continues Strong —"Break" Is Looked For, but Not Yet Evident—Steam Sizes Give Trouble— Bituminous Buying Lightest in Years —Prices Unstable — Contract Opinion Changes—Coke in Little Demand.

Anthracite—The market has varied but little from conditions prevailing for the past month. There is still a strong consumer demand for all sizes, yet judged by the tonnage represented on dealers' order books it would not take very heavy shipments to satisfy them. The week just past held the coldest weather so far and this had a tendency to boom business for a while.

The preference as to sizes is still centered on stove and nut, with egg but little behind, and pea strongly called for. All dealers continue to urge shipments of the larger sizes and while they are still willing to accept pea, many do not seem to be particularly anxious about it. Some dealers report a growing demand for briquetted fuel and the

boulettes seem to have made considerable progress this season.

Throughout the trade generally there seems to be an air of anticipation as to when a "break" will occur. It is fully realized that the anthracite industry is the only one not affected by present industrial conditions and is still moving along at top speed, both as to price and production. The first sign would naturally be shown in the dropping of the independent prices, but it can be stated positively that there is not the least indication of this at the moment. Independents are bothered with their steam sizes, but the other sizes are as firm as they have ever been. It is believed there may be some change not later than Feb. 1 and perhaps earlier.

Even the big companies are puzzled at times to know where to place buckwheat. They have about gotten through without storing up to this time, but with the industrial conditions unimproved it will be a serious question in a few weeks.

Bituminous—The market is the quietest it has been for years. Buying has been extremely light the past week, for many plants that had been expected to resume after the holidays have continued their idleness. It is unsafe to say that prices quoted represent the market exactly, for the reason that they are usually the quotations of the reputable concerns who are endeavoring to keep their plants moving at a fair margin of profit. One frequently hears of figures much less and we are inclined to believe they represent small quantities or else are quotations of concerns enabled to work on a lower operating cost than the average. We have heard Pool 9 offered at $4.50, and other good steam coals, such as Pool 10, at $3.75@$4. Pool 11 has been offered freely at $3.25@$3.75. As an evidence of the disparity of prices we know of some quotations on Pool 10 as low as $3 and on Pool 11 at $2.50. On Fairmont coals, while some of the larger concerns are asking $3 there have been shadings all the way down to $2 and in one instance we know of $1.50 being offered. This latter must have been due to coal standing on demurrage.

Due to the unstable market the consumer is rapidly changing his mind as to contract prices. On this account there is little contract business being closed, as the idea of a contract on good coal is slipping from the $4.50-mark of a few weeks ago until large consumers are beginning to hesitate at a price of $4 net ton at mines. There is no doubt that the bituminous business is going through a process of great change and it may run right into spring before real stability is attained.

Coke—Prices are as unstable as soft coal. For 72-hour $7.25 has recently been quoted, with $6.50 for 48-hour and some quotations made less than these. On prepared sizes figures are about $7.50 for egg, stove, small stove and nut. Due to the lower prices of coke this fuel is beginning to regain something of the gas trade that was lost during the war.

BALTIMORE

Close of Year Brings New Low Price Levels—Many Forced Sales—Tidewater Movement Light—Export Rates Are Lower—Anthracite Receipts Are Good.

Bituminous—The old year was ushered out and the new year brought into being while the coal trade here was in a state of depression. Sales of soft coal were made during the closing week of 1920 on a low record basis for that year.

The poorest grades of steam coals, such as Pool 18, were sold here in a few cases for the actual freight charges. Best grade steam coals, such as run to Pools 9 and 71 were sold on a basis of $4@$4.25 a net ton f.o.b. mines. Pool 10 coal brought $3.50@$3.75 during the closing days of the year and Pool 11 was freely offered at $3.50@$3.75. Gas coals were in very poor call and were offering freely for medium to best coals all the way from $2.50@$3.50 a net ton f.o.b. mines.

The car supply picked up greatly because of the holiday lay-offs and the run was close to 100 per cent in many regions. At Tide there was little doing, the piers having closed for several days at a time recently because there were no ships astream to load.

The loadings last week to Christmas were only about 28,000 tons of export cargo coal, and the entire month up to Christmas recorded only 189,980 tons of export cargo coal, with 17,434 tons more taken as bunker fuel. Charter rates are still lower, Rotterdam and French ports having been quoted as low as $4.75.

Anthracite—The run of anthracite here continues good. The Christmas and New Year holidays have brought some break, but no more than expected. As a whole the situation is pretty good and no one is complaining of a shortage, although some are dissatisfied at not getting enough company coal or coal of a particular size. This, however, is the usual mid-winter ailment. Prices will now undoubtedly remain constant over the balance of the coal year.

BUFFALO

Bituminous Prices Apparently at Bottom—Coal Moved with Great Difficulty—Coke Is Slack—Anthracite in Better Supply.

Bituminous—Prices seem to be about as low as they can go, for a good many mines are running at a loss. How long they can do so is hard to say. Possibly the miners would accept some reduction rather than see work stop, for they could hardly get other occupation this winter.

Shippers are getting next to no orders, but are deluged with requests from the mines, asking them to make an effort to relieve the situation by selling some cars of coal on track. For a while the Buffalo yards were filled up with unsold coal, but that practice has now dropped off, as there was too much loss connected with it.

Cars are plentiful everywhere. They are still moving liberally in most branches of the carrying trade, as is shown by freight trains on the roads. At the same time they are accumulating at a good many points. Bituminous prices are just what one can get, but a fair figure is $5 for Youghiogheny gas, $4 for Pittsburgh and No. 8 lump, $3.50 for all mine run and $3 for slack. Allegheny Valley thin-vein mine run is a little stronger than Pittsburgh. To this add $2.51 freight for Pittsburgh and $2.36 for the Valley coal.

Anthracite—The winter is on, and people who had depended on natural gas are asking for coal, as the gas supply is low. Dealers are giving everybody coal, at least a load apiece and if that continues the shortage will not last long. The escape from a bad shortage has been much more narrow than even the best posted thought possible, for slow mining late in the fall cut the lead over the amount a year ago and things began to look bad.

The new source of shortage made it impossible to flood the Buffalo retail trestles at the close of Lake navigation, which has commonly been done, and it will be some time before coal is as plentiful as was expected. Independent mines are getting about $4 premium for their coal, though it is claimed that this section does not buy much of it.

Coke—The demand is exceedingly light, jobbers reporting that a single car now and then is all they have been selling lately.

All furnaces are running at a slow rate and some of them have big piles of coke on hand. Quotations remain at $7 for 72-hour Connellsville foundry, $6.50 for 48-hour furnace and $5.50 for off-grades and stock. Domestic sizes are also dull at $7.75 for beehive furnace sizes, $10.50 for byproduct stove and $1 for breeze, to which add $3.64 for freight to Buffalo except the stove sizes, which are mostly locally produced and pay only about 52½c.

Northwest

MINNEAPOLIS

Colder Weather Braces the Market—All-Rail Receipts Are Good—Calder Investigation Leads Buyers To Expect Even Lower Prices.

The turn of the weather has come, and this had the prompt effect of bracing the steam market, which was badly demoralized. How long it will endure is almost wholly a weather proposition. And in view of the general attack upon the coal trade, originating with the Calder Committee, there will be an unusually strong effort on the part of buyers to hold for lower prices.

So far as the dock trade is concerned, the prospects for lower prices are not good. On the basis of the known facts, the coal on the docks cost practically the amount asked, less only a moderate profit, and cannot be sold for less without someone taking a loss.

For the present, the market seems to be sustained on the basis of the ruling prices, $9@$12 for Eastern bituminous. On Illinois coal, there was quite a slump in a number of grades, and prepared sizes, Franklin County coal, sold around $5@$5.50 at the mine, to which must be added freight of $3.75, handling charges and profit. Screenings have been a drug on the market. With wintry weather prevailing there will be a much better support from the buying trade.

Just now the trade is experiencing the usual result of an attack upon the business. Buyers of coal are taking mine prices and assuming that they should be the local cost, despite full knowledge that there is a heavy freight charge to be added as well as other costs. It is likely to be kept up for some time, for the charges and countercharges keep the subject before the public. The latter is irritated over the advanced costs and is very ready to believe that the increases were wholly manipulated. Although every article has had to take an increased cost, due to heavier freights, coal seems to catch the brunt of the blame.

The new year opens with a fair prospect for a well supported market for a time, but is likely to be weakened within a month or two, as the demand falls off early on the more Southern fields and this means an additional supply of coal which is generally offered to the trade of the Northwest. So long as the car supply is sufficient and transportation is reasonably good, the chances seem to favor an early weakening of the steam coal market—in fact, of all coals from the all-rail fields.

MILWAUKEE

Wintry Weather Injects Life Into Coal Trade—Deliveries Freely Made — Liberal Receipts of All-Rail Coal — Coke Held Firmly.

A spell of sub-zero weather has injected considerable animation into the coal trade by stimulating local deliveries and increasing the demand from interior points. Orders are being filled without restriction, as stocks of all grades of coal are deemed sufficient to last until spring, under a fair volume of replenishment by rail. Indications are that, aside from an occasional zero wave, the winter will prove to be mild.

Anthracite is selling $17@$17.20, with an addition of $1 per ton for carrying-in service. There is a good inflow of Illinois and Pocahontas coal. The former is held at $11.25. Screened Eastern steam coal sells for $12.25 shoveled off. The Illinois coal now coming by rail costs about $2 less than the latter figure.

The import of Illinois coal is bound to increase unless the holders of Eastern soft coal meet the situation. Notwithstanding the fact that the bottom has dropped out of the coke market in the East, the byproduct companies here are charging $17.25 for this class of fuel, which is about $1.25 higher than the prevailing rate in Chicago.

Inland West

CLEVELAND

Dullness Characterizes the Ohio Coal Trade — Better Demand Looked for After First of Year — Anthracite and Pocahontas Prices Higher—Bituminous Unchanged.

Bituminous—The reopening of a considerable number of industrial plants and a better rate of operation in others, expected after the first of the year, provide a basis for an optimistic feeling.

The question of supply is no longer a problem in this district, as coal is coming in ample quantities. The car supply, although still below normal, is sufficient to meet all needs, especially as some of the eastern Ohio mines are now closed.

Retailers during the past week have received a multitude of small orders, stimulated somewhat by a brief period of cold weather. The domestic demand, however, is falling somewhat below early estimates.

Railroads are now buying quite heavily and at some eastern Ohio mines are taking a large portion of the output. Industrial and manufacturing plants that have definite orders to begin work on early in January are expected to come into the market soon for steam coal in considerable amounts.

Steam prices now range $2.60@$3.25 for slack, with lump coal $3.25@$4.50. Prices for slack are as low as $2.50. Cancellation of contracts goes on, complaints as to quality usually being seized upon as an excuse for evading acceptance of shipments.

Retail prices of domestic coal have remained practically unchanged but continued mild weather is likely to cause some softening, signs of which are even now beginning to appear.

Anthracite and Pocahontas—Anthracite continues to come in slowly and dealers are still behind in deliveries. Retail prices have been advanced from $15.30 to $15.45 for all grades while shoveled Pocahontas has been increased from $12.25 to $12.35. Screened grades are practically unobtainable.

Retail prices of coal delivered in Cleveland are:

ANTHRACITE — Egg, chestnut and stove, $15.45.
POCAHONTAS—Shoveled lump, $12.35.
DOMESTIC BITUMINOUS — West Virginia splint, $11.50; No. 8, Pittsburgh, $9@$9.30.
STEAM COAL—No. 6 and No. 8 slack, $8@$9; No. 8 ¾-in. lump, $9@$9.30.

Receipts of bituminous coal for the week ended Dec. 25 were very light. Industrial receipts amounted to 1,221 cars, domestic 471 cars.

CINCINNATI

Cold Weather Strengthens Domestic Demand—Little Trading on Spot Market—Operations Closed Over Holidays.

Unusual quietness, due mainly to the current holiday season, was in evidence during the past week. Very little trading, save that of filling contract orders and those for domestic fuels, which have been on file for some time, were reported.

Return of severe cold weather has tended to strengthen the demand for domestic. Presence of this cold spell and the low pressure of gas have caused a somewhat stronger demand for steam coals.

A number of the mines supplying the Cincinnati market have practically shut down until after the holidays. Sufficient coal is in the market and the railroads daily are better able to ship coal as a result of the improving car supply.

A large quantity of coal from the West Virginia fields which is received in the Cincinnati market by way of the Ohio River is daily being shipped by this route, the river being free of ice and navigation conditions being normal.

No change in the wholesale prices of coal quoted f.o.b. mines is noted in the prices following: Bituminous lump, $5.50@$6; mine run, $4@$4.25. While the demand for Pocahontas lump is still strong, no exact quotations have been received. Pocahontas mine run was quoted at $5@$5.50 for contract orders while quotations for this grade on the open market were around $5.

Retail prices, as quoted by dealers, delivered to the consumer were: Bituminous lump, $9.25@$10.50; mine run, $8.50@$9.25; smokeless lump and egg, $11.25; mine run, $10@$10.50; anthracite egg, $15@$16.25; domestic egg coke, $14.50@$15.

DETROIT

Limited Steam Demand Continues—Domestic Better with Colder Weather—Prices Weaken Further — Anthracite Receipts Inadequate.

Both steam and domestic are in light demand, though indications of a broader inquiry for domestic stock are noted. The depression that for some time past has pervaded industrial and business lines is making its influence felt in both divisions of the trade.

With a large proportion of the manufacturing plants closed for inventory and others being operated on part time, requirements have been cut to a very narrow limit. Quite a number of factories are receiving no coal except consignments that may be coming to them under long term contracts.

Wide price reductions that have been made within the last few weeks are apparently ineffective in awakening a more active buying interest, which reflects an unwillingness to tie up working capital until a clearer idea is obtained of the probable trend of business during the coming year.

Weather conditions and lack of employment have had a weakening influence on the domestic market. Until the last few days the weather has been comparatively warm, enabling domestic consumers to reduce consumption to a low margin. This has discouraged liberal buying by the retailers. Dealers are not yet able to get anthracite in adequate supply.

Coals from Ohio and West Virginia

mines are now selling on about the same price level. Domestic lump is quoted at the mines at $4.75@$5. Mine run is selling about $3.25 and nut and slack bring $2.75. Despite the lessened buying there is apparently no excess supply coming to Detroit as jobbers and wholesalers are taking no chances with consignment coal.

COLUMBUS

Weakness Still Characterizes the Trade — Steam Prices Lowest in Months — Lump Is Fairly Active—Production Reduced During Holidays.

Slack demand continues, especially for the steam sizes. With many manufacturing concerns closed down either for the holidays or indefinitely, consumption has fallen off to a large degree. Railroads are taking some tonnage but their requisitions are curtailed because of slack freight movement.

Reserve stocks have been built up to a large extent and there is no marked tendency to buy for the future. Slack is a drag on the market and extreme low quotations are heard. Slack sells $1.50@$2 while mine run is $2@$2.75.

Domestic trade is holding up quite well. Lower temperatures have stimulated buying and dealers are still in the market. Arrival of the recent cold wave stopped the wholesale cancellations. The retail trade is in a generally healthy state with prospects for a fairly good run of business during the early part of the year. There is now no scarcity of domestic and dealers are catching up with their old orders.

Retail prices are still on the downward grade. Hocking and Pomeroy lump retails $7.75@$8.50. West Virginia lump sells for $8.50. Pocahontas is still rather scarce although a larger tonnage is coming in and retails $10 @$11. Kentucky grades are selling around $8.50.

Production was reduced by the Christmas holidays as well as because of low demand. Quite a few of the larger mines were closed. Car shortage is still one of the potent causes for reduced output. Labor shortage is disappearing as miners are more anxious to work than formerly. It has been the rule that when business begins to slump the miner becomes more industrious.

The Southern Ohio Coal Exchange for the week ended Dec. 18 reports an output of 291,821 tons from the 386 mines reporting, with a capacity of 624,679 tons. Of the shortage, 161,803 tons was due to car shortage; 69,209 tons to labor shortage; 4,725 tons to a strike; 31,483 tons to mine disability; 10,342 tons to no market and 55,296 tons from other causes.

Prices at the mines of the principal coals used in central Ohio are

Hocking lump	$4 00@$5.00
Hocking mine run	2 25@ 2.75
Hocking screenings	1 50@ 2.00
Pomeroy lump	4 25@ 5.00
Pomeroy mine run	2 25@ 2.75
Pomeroy screenings	1 50@ 2.00
West Virginia Splints, lump	4 25@ 5.00
West Virginia Splints, mine run	2 50@ 3.00
West Virginia Splints, screenings	1 75@ 2.25
Pocahontas lump	4 50@ 5.75

MIDWEST REVIEW

General Resumption of Industrial Activity Is Postponed—Many Mines Closing Because of Low Prices — Poorer Grades Reduced Further.

The coal market is still quiet. In the early part of the week, the Middle West experienced a cold wave but it was of such short duration that its effect was not felt on the coal market. Prices on high grade domestic such as Franklin County and Indiana Number Four remain firm but coals from other places are being reduced. There has been no change for the better in the steam market and it is getting to be a very serious problem as to where to move the poorer grades.

The industrial situation is worthy of note. A few weeks ago every one thought that industries on the whole would start up again shortly after the first of the year. We are now advised that a large number of factories who had planned on opening after the holidays will remain closed all during January and perhaps February. The pace has again been set by the Ford Motor Co. Early in December it was said that this factory would be closed only during the holidays, but have just been advised, on very good authority, that they would remain closed until Feb. 10.

The writer had occasion a few days ago to personally interview a number of factory owners in the Middle West. The prevailing impression obtained from these interviews was uncertainty on the part of every one. No orders are coming in and prospects for orders are light, therefore, no industrial activity is planned until orders are received and until the buying public once more gets back on the job. This uncertainty has permeated right down through the ranks so that factory labor now realizes that the high wages and bonuses prevailing a few months ago cannot continue. It is a wide-spread opinion that when it will become necessary to lower wages, but little opposition will be encountered from labor.

The attitude of the buying public toward the coal man is now somewhat changed. The average purchasing agent, who buys steam coal in large quantities, now believes that the coal man has done his part in reduction and consequent readjustment. Coal in some cases is now being sold at prices below cost, but that this is an unhealthy condition is not denied. Operators very largely, are realizing this and are closing their mines rather than operate and sell their product at a loss.

Railroads are in a position to supply mines with far more cars than they can use and coal is being moved through to destination promptly and satisfactorily. December freight tonnage for practically all of the railroads will prove to be abnormally light.

How long this period of inactivity will continue is a question that is engaging the best brains in this part of the country. There is one thing sure and that is that the public is anxious to see a renewal of industrial activity just as soon as it is possible and it is thought that there will be a buying rush and strong propaganda for renewed industrial activity on receipt of the faintest encouragement.

Current prices are as follows:

Southern Illinois (Franklin, Saline and Williamson Counties):		
Prepared sizes		$3.50@$5.00
Mine run		2.75@ 3.25
Screenings		2.25@ 2.75
Central Illinois (Springfield District)		
Prepared sizes		$3.25@$4.25
Mine run		2.00@ 3.00
Screenings		1.50@ 2.25
Northern Illinois:		
Prepared sizes		$4.00@$4.75
Mine run		3.25@ 3.75
Screenings (washed)		2.75@ 3.25
Indiana (Clinton and Linton, Fourth Vein):	State	Outside State
Prepared sizes	$3.45	$4.00@$4.50
Mine run	3.20	2.50@ 3.00
Screenings	3.00	2.00@ 2.25
Indiana (Knox County, Fifth Vein):	State	Outside State
Prepared sizes	$3.25	$3.25@$4.50
Mine run	3.00	2.00@ 3.00
Screenings	2.80	1.50@ 2.75
Pocahontas and New River:		
Prepared sizes		$5.25@$6.00
Mine run		4.25@ 5.00
Hazard and Harlan (Southeastern Kentucky):		
Block		$5.50@$6.50

ST. LOUIS

Warm Weather and Increasing Overproduction Gradually Wrecking Market —Steam Sizes Impossible to Move—Domestic Demand Easy.

A few days of cold weather helped the local trade a little in domestic sizes, but the market keeps on slipping. Steam sizes are down below cost, and the demand both locally and for outside shipments continues to diminish. Chicago shipments are almost unknown and nothing moves to the Northeast market that nearly all local operators were catering to three months ago.

The Northwest continues to take some domestic tonnage and a little moves up the valley, but in size it is a huge disappointment. Railroads are doing fine in helping with storage coal. The Missouri Kansas & Texas R.R. has its capacity in storage, and other roads are nearing theirs.

In the Standard field commercial mines get from one to two days per week. No-bills are on hand every night. Cars are plentiful and movement good. Somewhat similar conditions prevail in the Mt. Olive field with a little better working time.

In the Carterville field a few mines are idle for "repairs." Nearly all producers have no-bills every working day. This field is far ahead of the others in finding favorable markets and for the most part in nursing them for times like the present. Railroad tonnage is good.

The day of reckoning is here for operators who "flunked" on contracts and regular customers last summer and fell for the joys of temporary high prices. Mines are idle with lost markets as bitter enemies, and little hope of anything in the future.

Circular prices are still maintained, with a few exceptions, in the Carterville and Mt. Olive fields. The Duquoin and Standard fields lead in the effort to

see who can give the most for the least. Prices f.o.b. mines range as follow:

Carterville lump, egg and nut	$4.00@$4.75
Carterville mine run	2.75@ 3.25
Carterville screenings	2.00@ 2.50
Duquoin lump, egg and nut	3.25@ 4.25
Duquoin mine run	2.25@ 2.75
Duquoin screenings	1.50@ 2.00
Mt. Olive lump, egg and nut	4.00@ 4.25
Mt. Olive screenings	2.00@ 2.25
Standard 6-in. lump, 3x6 egg	3.25@ 3.75
Standard 2-in. lump, 2x6 egg and nut	2.50@ 3.00
Standard mine run	2.25@ 2.50
Standard screenings	1.15@ 1.50
Carterville rate to St. Louis	$1.52
Duquoin rate to St. Louis	1.40
Mt. Olive and Standard rate to St. Louis	1.35

St. Louis retail prices, effective Jan. 1, were reduced 75c. on Carterville, 50c. on Standard, and 25c. on Mt. Olive, while gas coke dropped $2 a ton and by-product $1.

CHICAGO

Spot Purchases Very Limited — Stocks Are Entirely Adequate — All Coals Offered in Excess of Demand.

Those having coal for sale are not trying to dispose of their product in Chicago as the whole situation in this city today is most unsatisfactory. The spirit of uncertainty which has prevailed all through the Middle West appears to be intensified in Chicago and but few companies are making any purchases.

Dealers have more stocks than they want and are being offered good coal every day at reduced prices, as some operators are still following the mistaken policy of shipping their coal on consignment. This has lead to some coal being held on demurrage and as this is a most expensive proposition, it can easily be understood how it affects prices to the public once shipments begin to draw demurrage.

Eastern coals continue to flood the market and it is a common thing to have smokeless as well as good splint coal from West Virginia go begging.

Prices of hard coals continue to be fairly firm although there have been some signs of weakening. There is no shortage of anthracite in Chicago now, as Western sales agents of some of the Eastern houses are looking for business.

South

BIRMINGHAM

Coal Market Subject to Usual Holiday Dullness—Good Movement of Contract Coal—Prices Are Unchanged.

The coal trade is reported as exceedingly dull, with very little demand. Inquiry tends to indicate that lower quotations will be in order after the first of the new year, which will probably have the effect of stimulating the market for steam fuel. Consumers evidently expect further price concessions and are remaining out of the market as far as possible to await developments. Unless the demand for commercial coal picks up considerably in the near future the influence of the heavy production now being maintained will have a tendency to cause a further slump in price schedules, which have been practically unchanged for the past several weeks.

Owing to the large tonnage covered by contract agreements the movement continues steady and heavy and it will require pretty regular operations at contract mines for several months to come to properly care for these contract obligations.

Domestic operations have ample orders in hand to warrant maximum schedules through to April 1 when conditions of the industry will probably warrant stability of prices and producers will be in position to take on contracts for the new coal year.

Reports from the coal fields are to the effect that many commercial operations are yet idle, the mine workers not having returned to their duties as yet following the Christmas holidays, but full working forces are expected by the first of next week. Output for the week ended Dec. 25 shows a heavy loss in tonnage compared with the preceding period, as most of the mines operated only four days and crews were normal during that time.

LOUISVILLE

Demand Dull for All Grades—Prepared Sizes Showing Up Better as Result of Cold Weather — Forced Sales at Low Figures.

Following colder weather, demand for domestic improved a little. However, orders for most part are for ton lots, and many buyers would prefer taking half-tons if they could, figuring that lower prices will be available later.

Retailers are out of line on prices, and some of them admit it. Some are asking $11.50 for eastern Kentucky lump, which can be had at mine prices ranging from $4.50 a ton upward carrying a freight rate of $2 or less. New concerns are springing up like mushrooms, and cutting the present quotations in order to get ready business.

Prices at the mines are weaker, as industrial demand is very dull, and railroads and public utilities are not buying. Cincinnati and Ohio appear to be overloaded. In fact, prices South and West are better today than East and North. Movement from eastern Kentucky over C. & O. rails eastward, is moving for less money than the same grade of coal coming to Louisville and beyond over the L. & N.

Quotations received show: Lump, Hazard, $4.50 and upward; Harlan, $5 @$5.25. The average eastern Kentucky field price on lump is very uncertain, being around $5. Mine run coal is quoted $3@$3.50; screenings, $2@ $2.50. Some eastern Kentucky screenings selling in competition with West Virginia have been offered at $1.75 on the Cincinnati market.

It's hard to figure a market today, as it is not a question of what the mine is asking, but what it is forced to accept, and on spot coal and cancelled shipments the operators are taking some very low figures, and the low figures are the ones that are remembered.

West

DENVER

Cancellations Continue, but Colder Weather Brings Steadier Market — Production Declines.

Colder weather has brought a more steady market, but cancellations of orders by retailers and refusal of jobbers to accept contract shipments is not yet ended. The output for the week ended Dec. 18 shows 10,961 tons lost through "no market" conditions. Production was 226,149 tons of a possible full time output of 272,376 tons, equal to 83.2 per cent of mining activities. Uncertainty of retail markets caused some of the loss.

The previous week had a "no market" item of 4,591 tons, and the week prior to that 3,680 tons. Domestic coal prices are tightening a bit and steam grades show slight reductions at the mine, but no change on the market.

Trinidad bituminous coking steam dropped from $3.50 to $3@$3.25, f.o.b. mines. Denver dealers were stocked with the old shipments, and the decline came before they had disposed of all old stocks.

Straight bituminous steam remains $2.50@$3, retailing at $6.75, while lignite steam continues at $2.40 at the mine. Routt bituminous lump is $6.50, retail $13, while Rockvale lump is $6, and $11.50 retail. Although there is only a difference of 50c. in the mine price, the retail difference is represented in freight charges.

Bituminous lump in the Trinidad district was $5.50, and the advance by the Colorado Fuel and Iron Co. to $6.50 at the mine conforms to the general price in the district.

Southwest

KANSAS CITY

Mine Prices Firm — Production Curtailed by Holidays — Cold Weather Stimulates the Trade — Retail Prices Are Lower.

Conditions in the Southwest coal market remained practically unchanged last week. Production was about equal to the demand. Colder weather stimulated buying and checked any further decline in mine prices.

The usual holiday labor idleness cut into the production somewhat, but this was not noticeable because of the easy market situation.

Operating conditions were good, both labor and car supply being adequate.

Dealers are working off old stocks in an endeavor to start the new year with current priced coal. There has been some recession in the retail prices for coals of the higher grades, such as Arkansas and anthracite, and the lower temperature has been reflected in a better call from domestic consumers.

News From the Coal Fields

Northern Appalachian

PITTSBURGH

Demand Diminishes Further—Industrial Consumption Is Light — Spot Prices Slightly Easier—Mild Winter Cuts Domestic Needs.

There has been a further slight decrease in demand for coal, but there was not room for much of a drop as demand had already become very light. Consumers who only a short time ago were anxious to obtain extra coal for stocking purposes are now indisposed to stock, not so much from lack of confidence in the coal market as from the change in industrial conditions whereby they are doubtful whether they will need a great deal of coal during the remainder of the winter.

Many industrial plants were practically closed during the last week of the year, including a large number of the independents in the steel industry, while the Steel Corporation, which is not a buyer of coal, has been running practically full, and at a better rate than a couple of months ago.

Demand for gas coal keeps up moderately well but offerings are such that the premium on gas coal over steam is somewhat reduced. Demand for byproduct is very light. The spot market is quotable at about $2.50@$2.75 for steam mine run, $3@$3.25 for screened gas or byproduct.

CONNELLSVILLE

Unprecedented Market Dullness—Production Much Curtailed—No Additional Contracting—Furnace Prices Recede Further.

There is no demand for spot furnace coke and scarcely any for foundry, while consumers are taking no interest in contract coke. The market could hardly be duller than it is. Certainly it never was so dull on this date in the year, as the Christmas holidays usually give the market at least a slight upturn and make the situation interesting.

Prices do not recede as much as would be expected in view of the lightness of demand, and that fact is ascribed to there being a new condition among the operators. Formerly, when conditions became unfavorable some of the operators, if not all, were desirous of operating in order to maintain their credit. At this time, on account of the recent large profits, all producers are very comfortably fixed financially and are quite willing to go through a period of idleness. Production has been curtailed week by week until it is now at a very low rate. Until last week the furnace oven production showed an advancing tendency, on account of the Steel Corporation producing more coke, but now even the furnace oven production is decreasing as so many of the independent steel interests have blown out blast furnaces and do not need as much coke as formerly.

There has been no additional contracting for furnace coke, and it does not look as though there will be. Contract business already reported amounted to something like 75,000 tons a month, for the first half of the year, generally at a ratio of 5 to 1 against basic pig iron, which is likely to open January with a $30 price, whereby the coke would be billed at $6. The spot market is quotable at $5.25@$5.50 for furnace and $7@$7.50 for foundry, per net ton at ovens.

The *Courier* reports production in the Connellsville and lower Connellsville region in the week ended Dec. 25 at a decrease of 33,900 tons, furnace oven production being 125,990 tons and merchant production 38,780 tons, a total of 164,770 tons.

CENTRAL PENNSYLVANIA

"No Market" Losses Cut Production—Cars Are Plentiful — Bonus System Abolished—Spot Market Quiet.

Coal operators are optimistic despite the greatly reduced prices. Some contend that coal has reached the low level and assert that there will be a rally after Jan. 1, when cold weather and the predicted revival of industry creates a bigger demand.

All the mines are well supplied with men and many operators could spare some were it not for the difficulty of getting them back again in case business picks up. Beginning with the new year, the bonus allowed miners will be dropped by all operators in the district. This will effect quite a large saving to the operators.

With practically no new orders for coal during the week ended Dec. 25, car supply far exceeded the demand. About the only mines shipping coal at present are those with big contracts. No new contracts are yet being made.

Prices for the past week ranged $3.25 @$4 at all the leading mines. In a few instances, coal was sold as low as $2.50 but only in small quantities where cars were loaded and on track.

EASTERN OHIO

Production Declines With Holiday Idleness—Spot Prices Recede—Lakes Contracts Being Negotiated.

Production for week ended Dec. 25 is estimated at 340,000 tons, which is little better than 50 per cent of capacity for a full week's operation. In addition to being a five work-day week because of the Christmas holiday, operating time lost account of labor shortage during the week amounted to 15@20 per cent. Car supply averaged around 68 per cent for all loadings and 50 per cent for commercial.

There are a few mines down account "no market," those being certain operations without screening facilities and turning out strictly mine run, for which the demand has been considerably less than for other grades. It is not expected that this situation will continue or be increased to any extent as an improvement in demand is anticipated. Some buyers of Lake coal for the Northwest are now coming into the market and negotiating for contracts on next season's supply. Operators express the opinion that as these negotiations are some six weeks earlier than usual this fact when it becomes generally known will have a tendency to stimulate local buying for present and future needs.

The holidays, accompanied by further curtailment in industry, has developed greater apathy in the demand, resulting in some spot coal being available at the following prices, which are slightly under those of last week; slack, $2.50; mine run, $2.75 and some lump $3@$3.25. However, on orders for future delivery or large quantities and contract coal, price range is, mine run and slack $2.75@$3.25 and lump $3.50@$4.25 f.o.b. mines. Domestic lump is $4.50@$5.

UNIONTOWN

Demand Still Falling — Operations Curtailed Over Holidays—Much Coke on Track.

Demand for both coal and coke seems to be falling to a greater degree each day. That situation is especially true of furnace coke which has no market at all at any price. While unconsigned cars in substantial numbers are on many sidetracks, neither operators nor their jobbers are able to find a buyer. Most of them "don't need the money," and the tonnage being on private tracks is not piling up demurrage charges. Therefore, those who have loads of coke on track have shown a disposition to hold cars until they secure their price for it.

Some few well-informed operators are holding the opinion that the shortage talk of last summer must bear its share of the responsibility for the extreme dullness of the present market. The panicky talk resulted in many consumers buying huge surplus stocks, even at the high prices. In many instances the surplus stocks cover needs of big consumers for the entire winter and for that reason they are not in the market for tonnage at any price.

Operators here seized upon the Christmas holiday to extend the curtailment policy. The holiday lay-off in many instances was extended into several days without complaint from the men. The Greek Christmas will be celebrated next week and it is expected that most operations will not do much until after that event has

passed. That will give the regions practically a two weeks' period of more restricted production than has prevailed in several years.

Coal is quotable at $2.50@$2.75 here but the market continues off and much difficulty is encountered in disposing of any tonnage.

FAIRMONT AND PANHANDLE

Many Operations Suspended Over New Year's — Demand Is Dull — Prices at Low Levels—Holiday Production Losses Are Heavy.

Fairmont

In the face of a steadily declining demand there was a general tendency among many companies to close down until after the first of the year. It was announced in many cases that there would be no resumption of operations until Jan. 3 for operators were of the opinion that there would be few orders on hand until that time. Low prices were determining factors in leading to a suspension of operations over the holidays, taken in conjunction with the fact that there was at least a 50 per cent decrease of contract orders covering the holiday period.

There were at least 45 mines on the Monongah Division of the B. & O. without orders during Christmas week, as well as a large number on Scotts Run and Robinson's Run in the Monongalia field. With coal at $2.35@$2.40 it was impossible for producers to dispose of their spot coal at a profit. Pool 44 coal was entirely out of the market, in so far as the spot demand was concerned. While low-sulphur coal was quoted at about $3 a ton there was little of it available.

Cars were hardly as plentiful as they had been during the preceding week on the B. & O. at least, yet there was little idleness at the mines on that road until about Thursday. By noon Thursday most of the mines in northern West Virginia were closed down for Christmas.

There was a marked tendency among some of the Eastern trunk lines to reject fuel on the plea that it was of inferior quality, operators declaring that was simply a part of an effort to secure lower prices.

Northern Panhandle

There was the usual light loading during the holiday season, beginning about the middle of Christmas week. Before the usual suspension, however, mines were not able to obtain a full car supply except from the Pennsylvania. On the B. & O. the supply was exceedingly short, mines having a placement not over 40 per cent of mine rating.

Demand for spot coal was largely at a standstill. As nearly as such prices could be determined mine run and slack were about $3. Even screened grades could not be sold at more than $3.25@$3.50. While few mines in the district were in idleness because of "no market" yet it was considered highly probable that the ability to continue daily operations was doubtless due to the usual light loading during the holiday season.

Middle Appalachian

LOW-VOLATILE FIELDS

Production Curtailed—Holiday Idleness Closes Mines—Demand Very Weak but Little Free Coal Sold—Contract Shipments Absorb All Production.

New River and the Gulf

December ranked as one of the worst months of the year from a transportation standpoint in the New River district. Car supply was unimproved in the week ended Dec. 25. Placements were not sufficient to move even the light tonnage required on the present sluggish market, being entirely too small for contract shipments alone. Production loss was all the more pronounced by the holiday shut-down.

Eastern markets secured the bulk of production, Western points manifesting very little interest in the New River product. Mine run remained at $5, domestic sizes $5.50@$6.

Spot business was lacking, but operating conditions would have made immediate delivery impossible. Contract business was not being curtailed to any great extent.

Between the shortage of cars and a short week, Gulf production in the week ended Dec. 25 was much curtailed. During the four days of operation, the car supply failed to average 50 per cent, the scarcity being nearly as marked on the Virginian as it was on the C. & O. Many contract orders remained unfilled so that Gulf mines were losing ground at a time when there was little or no spot demand. Current quotations averaged $5 a ton.

Pocahontas and Tug River

As mines in the Pocahontas region were not operated more than half of the week ended Dec. 25 there was a further reduction in the output. Even with the shorter working time there would have been a larger production had cars been more plentiful. A placement of 70 per cent by the N. & W. was wholly inadequate to fill contract orders so that the car shortage made a material difference, notwithstanding the fact that the spot market was dull.

Very little coal was being shipped to Western markets. On the few spot sales made mine run ranged $4.50@$5 with domestic $1 in excess of these figures.

While cessation of operations at mines in the Tug River field during the latter part of the week ended Dec. 25 made cars less necessary, nevertheless, a shortage still existed. The supply of empties was still limited to 60 or 70 per cent. Of course, Friday brought an end to operations for the week, some mines taking the opportunity presented to close down until after New Year's.

There was need of more equipment in order that mines might have kept contract shipments going more regularly for that kind of business was not much affected, although a few contracts made at higher figures during the peak of prices were being cancelled.

Whatever spot demand there was came largely from Eastern markets and even this was very feeble. The average quotation on mine run ranged $4.50@$5. Egg and lump were in somewhat better demand and were quoted around $6.

HIGH-VOLATILE FIELDS

Production Declines With Poor Market and Holiday Losses—Mines Closing Till Jan. 1—Prices Weaken Further—Car Supply Still Inadequate.

Kanawha

A number of operations have closed, not only over the holidays but until market conditions justify a resumption of work. Cars were still scarce, however, for those mines which continued operations, being estimated at 50 per cent of normal for the week ended Dec. 25.

The usual holiday cessation of buying, combined with the prevailing weak demand, further depressed prices, $3 for mine run being the top of the market, with slack $2.50@$2.75 and domestic sizes $5.50@$6. Numerous contract cancellations were still being received. Tidewater shipment was largely confined to contract. Western movement was fair:

Logan and Thacker

Several sales agencies in Huntington have shut up shop until such a time as there may be enough demand to justify their reopening. The holiday sluggishness in the market augmented the general stagnation of demand, which was not offset by many Logan operations closing down over the holidays. In the four days working time there was a slightly better car supply for the week ended Dec. 25, yet it is doubtful if the week's run of cars averaged over 50 per cent.

Shipments were largely on contract, many cancellations were being received and spot sales were very few, steam being sold $3@$3.25, and screenings $2.50.

Mingo mines were less affected by general market conditions. More plants which had been closed in the strike zone were getting ready to again produce coal, while other mines already in operation were adding to their working forces. Spot business was rather scarce but orders on hand were sufficient to insure operation for some time to come, especially since mines were just beginning to catch up after the enforced idleness due to the strike. The car supply was favorable to large production, as Mingo mines appeared to have first call on empties coming from western interchange points on the Norfolk & Western R.R.

Due to the presence of Federal troops, efforts to stop non-union miners from working were at a minimum. Contract obligations were being well filled and the few spot sales that were made went on a basis of $3.25 for mine run. Contracts were holding very well.

NORTHEASTERN KENTUCKY

Car shortage and dull market conditions caused heavier production losses during the week ended Dec. 25. Of the total loss of 56 per cent, car shortage caused 45 per cent. Some of the mines closed down early in the week until after the first of the year, owing to prevailing dullness in the market and to observe the holidays. Prices were hardly sufficient to justify operation of the higher-cost mines, with steam $3@$3.50 and slack down to $2.

Demand for domestic was somewhat stimulated by colder weather but steam grades were a drug on the market. Cancellations continued to be frequent and further contributed to the general inactivity. Gas and byproduct sold a little more readily than steam coals.

VIRGINIA

Aside from the customary idleness over the Christmas period, losses were running light and production heavy. Car service conditions were fairly satisfactory and the labor situation was excellent. Combined losses for the week did not exceed 35,000 tons.

Slackening of operations at snowbird mines is not taken seriously as these mines do not ship coal on a competitive basis. The larger producers are running full time, with spot prices steady at $3.50@$4.

Middle West

WESTERN KENTUCKY

Production Declines With Holidays—Both Steam and Domestic Demands Are Weak, but Prices Are Unchanged.

As a result of Christmas some of the mines are down and production has eased off slightly. Prices are a little steadier. Demand for prepared sizes is expected to improve if the present near-zero weather continues a few days.

Jobbers and producers say that one reason for the present slow movement of prepared sizes is that in many instances retailers have not reduced prices in conformity with mine reductions, which has made the public hold back. This is resulting in markets being unable to accept any great amount of prepared coal. Industrial buying is very light as a whole, and public utilities are overstocked. Railroad buying is also light.

It is believed that after the first of the year, regardless of weather conditions and movement of prepared sizes, there will be a better demand for steam coal, as various plants will then be running low on coal, and will have to start buying for replacement.

Principal quotations show the western Kentucky field average for the week ended Dec. 25: Prepared sizes, $5.35; mine run, $3.35; screenings, $2.70. Most of the sales showed lump, $4.25@$5.25; mine run, $2.75@$3.75; screenings, $2.50@$3.25. It is reported that the quotations on prepared sizes this week are $4.25, but some mine run is offered at $2.50, and screenings can be had around $2.25 and up.

DUQUOIN

Good Production Still Maintained—Labor Is Plentiful—Market Is Quiet—Prices Steady.

Mines are still working about 85 per cent of full time. However, there is nothing in sight to insure a continuation of this condition. No mines are reported as having shut down on account of market conditions as yet. The output is rather small this week, largely due to the holiday season, many of the miners laying off.

Labor conditions are unusually good and many men are reported on their way to the southern Illinois fields from industrial centers where factories and plants are closing down. One mine in Franklin County had seventy-five men and boys apply for employment but were unable to use any of them. Most of the men were from the northern industrial centers. It is predicted that by the first of April the mines will have had to turn out many of their men.

Prices during the week remained the same as last week with scarcely no more demand noted even with the cold wave and snowfall. Screenings were plentiful and were quoted $1.50@$2.25; lump, $4@$5; mine run, $3.50@$4.50.

INDIANA

Steam Prices at Bottom — Domestic Weakens—High-Cost Mines Closing—All Demands Are Sluggish.

Prices on industrial grades have reached the lowest point in several months. The downward trend on domestic has not been as marked as the drop in steam price, but there have been reductions in the prices the Indianapolis consuming public have paid for coal in the last few weeks.

Few mines have storage facilities, and with the lessened demand for steam coal and the continued call for domestic, operators have been hard put to dispose of steam sizes. The good demand for domestic has made it possible for them to make up at least part of their losses.

Within the last two weeks, steam prices have dropped $1 a ton. Mine run is quoted $3 at the mines, and an offer of a quantity of screenings at $1.75 has been made. The price has hovered at $2 for several days. Mine run coal from other fields, both East and West, has dropped in price 75c.@$1.50 a ton in the last two weeks, with the exception of Pocahontas and New River coal, still quoted at $5 at the mines.

Domestic sizes of Indiana Fourth Vein are selling at about $8 a ton in Indianapolis. The best grade of Illinois domestic is $9.25, while what Pocahontas lump is obtainable sells at $13.50.

Mines whose whole output is mine run, sold to industrial users, are facing hard times, unless the demand picks up after the first of the year. Some are glad to sell their output at cost. Most of these are high-cost mines, which started operation when the coal market began its skyward climb.

Southern Appalachian

SOUTHEASTERN KENTUCKY

Continued Decline in Prices—General Production Slump Over Holidays—Car Supply Improves.

Prices continue downward, with apparently no bottom in sight. Considerable coal is being offered at a price that will not allow a margin of profit to the operator, but the present disposition seems to be to cling on until after the holidays in a hope that the market will again swing upward.

Many mines have closed down for the holidays, and the tonnage produced will be far below the average weekly production. The few mines that are trying to run this week report very low daily tonnages, due to the unwillingness of the miners to work during the holidays.

Continued efforts of operators to force the L. & N. R.R. to give a better quota of cars seems to be having some effect. The car supply has been better in this field for the week ended Jan. 1 than for many months.

Price quotations are around $5 for block, $4.50 for egg, and $1.75@$2.50 for steam.

West

UTAH

Market Becomes Quiet—No Domestic Demand — Labor Conditions Are Excellent.

Instead of there being a shortage of coal in Utah this winter, as was feared a few months ago, some of the mines have not been working full time during the past week or two on account of quiet market conditions.

The cold weather which set in about ten days ago has caused the demand for coal to increase somewhat, but so successful has the summer sales campaign, conducted by retailers, proved to be that consumers seem to be well stocked for some time yet. Movement to the coast is not yet affected by the more seasonable weather.

Labor conditions continue to be excellent. Men are available in any number and are working better than for some time. The industrial depression is causing the return of much mining labor.

MINE And COMPANY NEWS

ALABAMA

Fire of unknown origin recently destroyed the hospital building of the **Sloss-Sheffield Steel & Iron Co.**, Birmingham, at Flat Top Coal Mine, entailing a loss of from $20,000 to $25,000.

ILLINOIS

One of the largest deals in the history of southern Illinois coal mining recently took place when the **Bickett Coal & Coke Co.**, of Chicago, owning extensive operations in Indiana, took over the entire property of the **Royalton Coal & Coke Co.**, at Royalton, Franklin County. Included in the sale were 7,000 acres of undeveloped coal land and the two mines now in operation. The mines are the largest in the vicinity, having a daily tonnage of from 4,500 to 5,000 and make five sizes of prepared coal.

The Carlinville and Berry mines of the **Standard Oil Co.** in Macopin County were closed down recently when a break down put the electrical hoisting machinery out of working order temporarily.

Donk Bros. Coal Co. of St. Louis, now operating several mines in the Standard field, are preparing to sink a new mine north of Coffeen. A switch will be constructed from the Big Four railroad to the site where the mine will be located.

The property of the **Lerner Coal & Mining Co.** at French Village has been placed in the hands of a temporary receiver, Wm. T. Barnett of St. Louis. Harry W. Lerner, president of the concern, alleges that the company is insolvent and that creditors are threatening to sue. The mine has not been working since early in November when the miners quit because they had not received their pay.

INDIANA

The **Big Three Coal Co.**, Evansville, has struck coal in its shaft at bank No. 2, near Bradley Station in Spencer County, a few miles east of this city. The vein runs from 4½ to 5½ ft.

KENTUCKY

The C. L. Ryley Coal Co., mine agents and wholesale dealers, has been incorporated for $200,000 in Lexington. The concern has been operating as an individual. **Paul Allais**, of Chicago, general manager of the Columbus Mining Co. was elected vice president of the company. C. L. Ryley will continue as president of the company, but the administration will be left in the hands of his son, C. Reginald Ryley, first vice president, and Mr. Allais.

Articles were filed recently increasing the capital of the **Fayette Coal Grain and Feed Co.**, of which C. L. Ryley is president, from $10,000 to $50,000. The company operates an electrically-equipped wholesale and retail coal, grain and feed dispensary in Lexington. **Number Four Superior Coal Co.** will henceforth work with a capital of $200,000 instead of $80,000 and the **Trace Fork Mining Co.**, with $200,000 instead of $100,000. C. L. Ryley is president and C. Reginald Ryley vice president of both companies. John R. Pates is secretary-treasurer of number 4 Superior.

The **Elkhorn-Cumberland Coal Co.**, Praise, Ky., operating at Elkhorn City, near Praise, is planning for the construction of a new coal tipple at its properties. A new power plant will also be constructed, as well as a housing development to consist of an initial allotment of about 25 homes.

The Creech-Duffy Coal Co., Calvin, Ky., recently organized at Pineville, Ky., will soon commence the construction of a tipple at its local properties. Considerable mining machinery will also be installed at the workings.

The **Elkhorn, Jr., Coal Co.**, Millstone, Ky., is planning for the construction of a new coal tipple at its properties; a number of miners' homes will also be erected.

The See-See Coal Co., Pineville, Ky., recently organized with a capital of $150,000, is planning for the construction of a new power plant at its properties. A new steel coal tipple will also be erected.

The **Coil Coal Co.**, Madison, Ky., will soon commence the rebuilding of its tipple, recently destroyed by fire.

The Columbus Mining Co., McCormick Building, Chicago, Ill., plans for the development of a large tract of coal land at Lenut. Four mines will be established on a 4,000-acre tract, and machinery installed for a capacity of over 2,500 tons of coal per day. J. B. Hilton is secretary and treasurer.

MARYLAND

The Old Colony Coal Co., Cumberland, Md., has been formed with a capital of $200,000 to operate properties in this section. The company is headed by G. Albert Sell, Jesse A. Hoover and William E. Glick, all of Cumberland.

MINNESOTA

The **City Council of Minneapolis**, is still considering constructing unloading facilities in connection with the docks on the Mississippi River. The problem of handling coal from the river barges is one which calls for consideration, since that is one of the big points in favor of river development.

OHIO

The **C. R. Cummins Coal & Mining Co.** of Cleveland, was recently authorized by the Secretary of State to increase its capitalization from $15,000 to $15,000,000. The main office of this company is in Cleveland, and they are developing a stripping operation near Oakland City, Ind., on the Southern Railway, St. Louis division, where they expect to produce about 30,000 tons per month. The officers are: C. R. Cummins, president; H. T. Sympson, vice president; W. E. Beaumont, treasurer, and S. M. Paxton, secretary. The company has a branch office at Oalkand City, Ind., with Messrs. F. I. Conyers and P. J. Watson as district officers in direct charge of operation.

The **Glen Valley Coal Co.**, Nelsonville, has been chartered with a capital of $25,000 to mine and sell coal. Incorporators are D. N. Postlewaite, J. W. Bricker, H. H. Orr, R. Hade and E. Rauck.

Papers have been filed with the Secretary of State increasing the capital of the **West Virginia and Ohio Coal & Coke Co.**, Cleveland, from $15,000 to $50,000.

Ohio farmers have saved $17,325,000 during the past year by burning wood instead of coal. This is the estimate placed on the saving by the Ohio Farm Bureau after making a survey of the state.

PENNSYLVANIA

The Citizens Coal Co. of Nant-y-Glo, Cambria County, has leased two hundred acres of C vein in Jackston Township and Nant-y-Glo Borough, from the John Lloyd estate.

The **Bowers Coal Mining Co.** is rushing operations through to completion on the new mines at Clearfield and the grading of 1,650 ft. of road bed.

The **J. S. Wentz Coal Co.**, Hazleton, Pa., has construction under way on its new breaker and expects to have the plant ready for service in about 30 days. The structure will provide for an increase in output of from 800 to 1,500 cars a day, and it is proposed to operate at this capacity. The extra tonnage will be secured from the Porter Swamp tract, near Hazle Brook, operated under a lease with the **Lehigh Valley Coal Co.**

The **Maher & Graff Coal Co.**, Pittsburgh, Pa., is being organized to operate coal properties in this district by Paul C. Maher, Robert C. Maher and Hyett P. Armstrong.

The **Upper Lehigh Coal Co.**, Hazleton, Pa., is planning to resume operations at its No. 6 property, abandoned some time ago. Electric pumping machinery will be installed at once to clear the property, and it is expected to commence active mining at an early date.

Anxiety to put enough coal on the market to meet the pressing demand for anthracite, is leading coal companies to again draw upon the big culm banks here, recently the **Herbein colliery banks**, Pottsville, which are said to contain nearly 1,000,000 tons were opened up. Big steam shovels are lifting the culm into chutes from which it is run into the washeries. A number of other banks, equally as big, are to be developed at once.

The Island Creek Coal Co. at the close of this year will report earnings of approximately $20 a share, or nearly three times as great as in 1919, according to interests in close touch with the company. It is said that these increased earnings have not been based on any such high prices for coal as have recently aroused so much criticism, and that a return of prices to lower levels will not materially interfere with the company's profits. Net quick assets at present amount to over $3,800,000, of which nearly $3,000,000 is in cash or the equivalent.

At a meeting of the stockholders of the **Atlantic Coal and Iron Co.**, Real Estate Trust Building, Philadelphia, Pa., the following officers were elected: Williams H. Bilyeu, president, Philadelphia, Pa.; Hon. Adam C. Littlepage, vice-president, Charleston, W. Va.; Wm. C. Yerkes, assistant to the president, Philadelphia, Pa.; Chas. Gesing, Jr., secretary and treasurer, Philadelphia, Pa.; G. M. Davis, assistant secretary and treasurer, Charleston, W. Va.; F. D. Enney, general manager, New York City, N. Y. The company has also opened a branch office in the Charleston National Bank Building, Charleston, W. Va. It is the intention of the company to operate its own mines in the near future in the Charleston district.

The Consolidated Fuel Co., Pittsburgh, have contracted for the installation of equipment for their shaft tipple at Francis Mine.

The Alicia No. 2 mine of the **Pittsburgh Steel Co.**, up the Monongahela River from Brownsville, has been shut down for an indefinite period owing to curtailment of operation at the mills of the company. The Alicia No. 1 coal and coke plant is still operating on a reduced output.

The **H. C. Frick Coke Co.** are employing many of the men laid off by other coal and coke operations and increasing their output and firing additional ovens.

The Scranton Coal Co., Scranton, Pa., is said to have plans under way for the rebuilding of its Raymond colliery and washery, near Peckville, recently destroyed by fire with loss estimated at about $200,000, including machinery and engine plant.

The fire in the **Union Connellsville Coke Co.** mine at Simpson, Fayette County, is still burning, despite the efforts made to smother it by sealing the shafts.

WEST VIRGINIA

The Diamond Coal Co., Fairmont, is erecting a two-story office building at its operation along Scott's Run in Monongalia County. This is reputed to be one of the largest mines on the run, having some of the very best in quality in that section.

The **Fowler Branch Coal Co.**, Itmann, W. Va., is having plans prepared by H. B. Wright, chief engineer, for the construction of a new coal tipple and a number of mechanical buildings at its properties, to include machinery shop and machinery parts plant.

Operations of the **Fairmont and Boulder Coal Co.** will be in Barbour County, near Boulder on the Grafton and Belington division of the Baltimore & Ohio R.R. This company has only recently been organized, its capital stock being $25,000. The office of the company will be in Fairmont. W. D. Reed, J. W. Poling, Seymour McIntire, W. F. McKain and Charles E. Hawson of Fairmont are interested in the company.

Further development of **coal lands in** Nicholas County will be undertaken by **R. C. Corman** who has leased a tract of 500 acres from A. L. Craig, E. E. and J. W. Detlz, this land being on Cherry River between Fenwick and Holcomb. The work of developing the tract under lease will be begun at once. The coal is in the New River seam.

E. C. Minter, Beckley and associates have organized a new coal sales agency with headquarters to be known as the **E. C. Minter Fuel Co.**

Carl W. and R. A. Brannell of Pittsburgh, Pa. having leased a large tract of coal land on Little Laurel River near Cornith, in Preston County from David B. Reger, J. K. Buchanan, Louis Core, Carl Reger, Roy Reger and J. B. Chevront, will develop the tract so leased by sinking a 100-ft. shaft and installing electric power equipment at an estimated cost of $200,000.

The Fowler Branch Coal Co., Farrelsburg, W. Va., recently organized, has leased about 70 acres of local coal properties and plans for extensive developments. Considerable machinery will be installed and a new tipple constructed.

Owning a tract of 155 acres near Sand Run on the Charleston division of the B. & O. the **Crown Coal Co.**, Blaine, just organized, will erect a plant on the tract and, with that end in view, has started driving an opening and general development work.

The **Wheeling Quality Coal Co.** Wheeling, W. Va. is planning for the development of extensive coal properties at its holdings, and will install machinery for this purpose. It is planned to build a new coal tipple, install electric hoisting equipment, etc. H. W. Campbell is secretary.

Organization of the **Pigeon-Thacker Coal Co.**, Huntington, presages development work on a very extensive scale in the Pigeon Creek section of Mingo County, made possible by an extension of the Norfolk & Western, this land having been leased to the new company, which was a capital stock of half a million. Largely interested in the new company are G. M. McLaughlin, Walter M. Parker, W. J. Wolfe, Philip P. Gibson and Dudley R. Porter.

The Brewer Coal Co., Morgantown, will operate in Cass District of Monongalia County having just been organized by Morgantown people with a capitalization of $100,000. Offices of the company are to be in Morgantown. Active in effecting a preliminary organization of the company were: David S. Brewer, R. D. Barrickman, Julius Baur, John B. Barkert and C. M. Barrickman.

Holdings of the **Mapletown Coal Co.**, Morgantown, including about 1,000 acres of coal land, together with the mining plant of the company named have been acquired by the **Rosedale Coal Co.** at a cost of $500,000. Among those principally interested in the Rosedale company are: E. G. Donley, Morton Van Voorhis, C. L. Lantz, J. L. Hatfield and Asa Sterling.

McDowell County is to be the scene of operations of the **Vera-Pocahontas Coal Co.** which is capitalized at $80,000 having just been organized and chartered. Active in organizing this concern were: V. T. Strickler, J. W. Johnson, S. E. Ward and C. I. Bridges, of Iaeger, W. Va.; G. G. Kellar of Berwind; S. E. Clendennin, Bluefield, W. Va.

Business men behind the Pigeon-Thacker Coal Co., Huntington, are also the leading spirits in the **Logan-Thacker Coal Co.** which will have an operation in Mingo County, among those so interested being C. M. McLaughlin, Walter M. Parker, W. O. Wolfe, Philip F. Gibson and Dudley R. Porter of Huntington. The company has a capitalization of $500,000.

Development of Logan County coal land in the Chilton and Eagle seams will follow the organization of the **Chilton-Eagle Coal Co.** of Logan, this new concern having a total capitalization of $300,000. Closely identified with the new corporation are: George D. Miller, R. C. Thurmond, E. H. Butts, all of Huntington; S. A. McCallister and Hunter Green of Hughey, where the new company will operate.

Word was received of the consummation of two deals at Uniontown, Pa., involving the **purchase of West Virginia coal lands**, aggregating $3,000,000. The sales were made by Uniontown companies. **The Maher Colleries Co.** of Cleveland purchased 15,000 acres of coal land in Monroe County. **The Ruth Coal & Coke Co.** sold 3,000 acres in Marshall County to the **General Development Co.**

ALASKA

A line of steamers between Portland and Alaska is to be installed next year in connection with the opening and operation of the old Cunningham coal mine located inland from Controller Bay, Alaska, according to announcement made by J. P. Jaeger, president of the **Alaska Coal & Coke Co.**, a Portland concern, which has a lease on the mine.

Traffic News

The Wheeling & Lake Erie R.R., which has some 60 mines on its rails, expects to begin receiving delivery by Jan. 1 of a 2,000-lot of new 50-ton all-steel gondolas at the rate of 25 cars per day.

Investigation and Suspension Docket 1199.—Report also embraces I. & S. Docket 1219, Absorption of Terminal Charges at Galveston, Tex. The I. C. C. decision rendered is that increases in the through charges on export, import, and coastwise traffic to and from ship side at Galveston, Texas City, Port Bolivar, and Beaumont, Tex., under proposed tariff rules limiting the amount of terminal charges absorbed, found not justified. Orders of suspension vacated as to certain schedules which do not have the effect of increasing charges.

In the case of the **Roundup Coal Mining Co. vs. the B. F. and I. F. R.R.** a tentative report of an I.C.C. examiner recommends that the rates on coal from Roundup and Geneva, Mont., to destinations on the Chicago & Northwestern; Chicago, St. Paul, Minneapolis & Omaha and Minneapolis & St. Louis railroads in North and South Dakota are unreasonable and prejudicial and that reasonable and nonprejudicial rates be prescribed for the future.

The Denver and Rio Grande R.R. has agreed to cut the coal rates from the Baldwin field to Santa Fe after negotiations between the railroad and the corporation commission. The reduction is effective Jan. 1.

The Interstate Commerce Commission has approved a loan of $3,759,000 to the Chesapeake and Ohio Ry. Co. one of the principal coal carrying roads of the country, to assist it in purchasing one thousand 100-ton steel coal cars.

The **Interior Department** has received applications from Peter O. Sundberg for a lease of 320 acres and from John C. Murphy for lease of 1,200 acres of coal land in the Matanuska, Alaska, field.

In a complaint to the I. C. C. the **St. Louis-San Francisco Ry. Co. vs. the East St. Louis and Suburban Ry. Co.** attacks as unreasonable the rates on coal from stations in Illinois to St. Louis, and requests reasonable rates and equitable divisions of joint through rates and adjustment of charges collected.

In the complaint of the **Gillespie Coal Co. vs. the Illinois Traction System**, an I. C. C. examiner recommends that the rates on coal from the Gillespie mines at Gillespie, Ill., to certain interstate destinations be declared to be unduly prejudicial, and that the undue prejudice be ordered removed.

The Commission has decided, upon petition of tidewater coal exchanges, for modification of the **96-hour credit rule on demurrage** charges on tidewater coal, that the period of 96 hours for the payment of transportation rates and charges be computed from the first 4 p.m. after the time when such exchanges present to individual shippers the demurrage bills.

Justice Van de Vanter denied the claim of the **Minneapolis, St. Paul and Sault Ste Marie R.R.** to recover freight rates on coal in excess of rates established by the state of North Dakota, which rates had been nullified by a prior Supreme Court decision. In the case of the railroad vs. the **C. L. Merrick Co.**, the latter company, the shipper, sought to recover charges exacted in excess of the statutory rate. The shipments were made prior to the first judgment in the injunction suit when the carrier was refusing to give effect to the schedule and the excess was paid under protest and because the carrier would not deliver the coal on payment of the statutory rate. In the trial court judgment was against the shipper, which was reversed by the North Dakota Supreme Court with directions to award the shipper the sum claimed. The Supreme Court of the U. S. on Monday dismissed the writ of error brought by the railroad company to set aside this action.

In the complaint of the **Seaboard By-Product Coke Co. vs. the Director General**, the I. C. C. has decided that the rates on coal from mines on the Pittsburgh and Lake Erie R.R. in Pennsylvania to Seaboard, N. J., are not unreasonable, and dismisses the complaint.

A deficiency estimate of $27,000 for **fuel for public buildings** for the current year has been requested of Congress by the Treasury Department.

Rep. Goodykoontz, of W. Va., in a speech in the House **recommending repeal of the Lever Food and Fuel Control Law**, said that in the Judiciary Committee he had offered a motion to include the Lever law repeal in the war repeal bill but it was defeated by a vote of 8 to 6. He said very little good and much harm had come from the Lever law.

A hearing was held in Louisville, Ky., recently of the Interstate Commerce Commission on the formal complaint of the **West Kentucky Coal Bureau** for a rate from western Kentucky mines to northern Arkansas and southeastern Missouri of 25c. over the through rate from the southern Illinois group of mines, it being alleged that present combination rates are excessive and that through rates are needed and are reasonable if worked out on this basis. Testimony introduced generally favored the western Kentucky operators.

A bill already passed by the Senate providing for agricultural entries on **coal lands in Alaska** has been reported to the House by the Territories Committee.

President Wilson has nominated to the Senate and that body at once confirmed out of courtesy to its member, **Senator John F. Nugent** of Idaho to membership on the Federal Trade Commission, which is of interest to the coal trade as the commission has been inquiring into coal costs, its right to require reports from operators now pending in litigation in the courts. Senator Nugent will take the place vacated last September by **W. B. Colver**, and will serve for a seven year term. He is undecided whether to assume his new duties now or remain in the Senate until his term expires March 4. He has been a Senator since January 1918, and is a lawyer, his residence being Boise, Idaho.

Trade Catalogs

Small Turbo-Generator Sets — General Electric Co., Bulletin 420010. Illustrated, 22 pp.—Advertiser.

Electric Heating of Air—Cutler-Hammer Mfg. Co., Milwaukee, Wis. 4 pp. Illustrated.—Advertiser.

Market Data Book—Lists all publications of the U. S. and Canada, rates, closing dates, etc. G. D. Crain, Chicago, publishers.

Water Supply and Turbine Pumps—Coyne & Bowler Co., Memphis, Tenn. 64 pp. well illustrated. Describe new design and types of construction.

Tubular Steel Poles—National Tube Co., Pittsburgh. 47 pp., illustrated, describes design and use of poles.

Oil Tanks and Pumps—Wayne Oil Tanks Pump Co., Fort Wayne, Ind. General catalog containing bulletins recently published, illustrated.—Advertiser.

Oil Conservation — General Electric Co. Bulletin 407006, 10 pp., illustrated. Describes conservator type of tank for power transformers.—Advertiser.

Locomotive Cinder-Handling Plants. — Roberts and Schaeffer, Chicago, Ill. Describes new plants in detail, 15 pp., illustrated.

Mine Locomotive Headlights — Westinghouse Electric Mfg. Co. Bulletin 7 A-C 1. Features of new construction revealed. 4 pp., illustrated.—Advertiser.

Personals

Mr. Gibson Hardy, of Brownsville, Pa., superintendent of the Sunshine plant of the American Coke Corporation, has been promoted to the position of general superintendent of all the operations of the company, with headquarters in Uniontown, Pa., to succeed **Mr. Frank Peabody**, who has been transferred to the Pittsburgh office of the company. **Mr. James Boyle**, assistant mine foreman of the Sunshine mine has been promoted to succeed Mr. Hardy.

Clyde Weihe has resigned as master mechanic for the Washington Coal & Coke Co., Colorado at Star Junction to become superintendent of the Corrado coal mines at Confluence and Virgin Run.

Charles B. Franks, for 21 years superintendent at Leisenring for the H. C. Frick Coke Co., has resigned that position Mr. Franks, with a number of associates has taken over extensive coal holdings and he will devote his time to these interests.

Frank L. Poindexter, assistant general superintendent of the Chesapeake & Ohio Ry. Co., has resigned to become the general manager of the Lake & Export Coal Corporation of Huntington.

Albert Torquato has gone to New York from Windber to establish a general employment agency. The Windber field is filed with miners, and he will distribute foreigners to all the fields according to contract orders from the port of entry.

Harry H. Brown, Huntington, has been chosen as president and manager of the Dominion Smokeless Coal Co. which will operate at Huntington.

I. B. Perkins has been named as manager of the operations of the Two-Seam Coal Co., recently organized. His headquarters will be at Boomer, W. Va.

Secretary Charles O'Neill of the Central Pennsylvania Coal Producer's Association, delivered an address before the Rotary club in Altoona at the regular meeting in the Logan House. Mr. O'Neill reviewed the coal industry to show its importance in the industrial field.

Willard J. Boston, Scranton, Pa. is now with the Old Colony Coal Co., Pittsburgh. For the past eight years Mr. Boston has had direct connections with some of the largest operators in the various coal centers, being well versed in classifications of coals and a mining engineer of high standing.

Harry Maddy, fiscal supervisor and secretary of the Ohio Board of Administration has resigned to accept a position with the Wayne Coal Co., at Pittsburgh. He had been in the state service for more than 10 years.

W. J. Harahan of Norfolk has been elected chairman of the Chesapeake and Ohio and the Hocking Valley railroads, succeeding the late **George W. Stevens**. He was formerly president of the Seaboard Air Line, before joining the U. S. Railroad Administration.

The Chicago Pneumatic Tool Co. announces the resignation of **H. L. Dean**, formerly manager of the compresor and engine sales division.

John Nuttall who for the last six years has been the Circuit Clerk of Fayette County, W. Va. will, at the expiration of his term on Jan. 1, enter the coal business as an assistant to H. H. Blackburn who is preparing to operate in Greenbrier county, near Rupert, W. Va.

W. J. Schnabe has recently joined the sales force of Campbell, Peacock & Kinger, Inc., and will look after the Tidewater and line business in the New York territory.

J. L. Miller, formerly with the N. Y., N. H. & H. will represent the same company in the New England territory.

The new superintendent at the Edwards mine of the Southern Coal Co. at Volga, W. Va., is **A. B. Teets**, who has succeeded **T. H. Bassee.**

W. T. Hopke who for a number of years has been the master carpenter for the Monongah division of the Baltimore & Ohio R.R. has resigned that post to devote his entire time to the affairs of the Ursula Coal Co. of Harrison County, W. Va., in which he is heavily interested.

The Chicago Pneumatic Tool Co. announces the appointment of **J. F. Huvane** as Eastern manager of compressor and engine sales, with headquarters in New York, and **G. C. VandenBoom** as Western manager of compressor and engines sales, with headquarters in Chicago.

A recent visitor in Huntington, W. Va. was **H. W. Oswald**, general manager of the New York offices of Coale & Co., that company having a district office in Huntington, W. Va.

W. Gaston Caperton of Slab Fork, W. Va., treasurer of the Winding Gulf Operators Association was a visitor in Philadelphia on December 13 and 14 attending the annual meeting of the association.

William McKell, president of the McKell Coal & Coke Co., with headquarters at Glen Jean, W. Va., was in Philadelphia for the annual meeting and election of the Smokeless Coal Operators Association of West Virgina.

C. C. Beury, of Charleston, W. Va., president of the Beechwood Coal & Coke Company and of other companies in the New River field was at Philadelphia for the annual meeting of the Somkeless operators of West Virginia.

Thomas Jordan, of the Bell & Zoller Coal Co. of Chicago, operating several mines in southern Illinois, has recently joined the forces of the Logan Coal Co. of Philadelphia in its Chicago offices.

F. K. Straub, a graduate of the University of Illinois in class of 1920, who received a fellowship in Mellin Institute as a chemist in coal carbonization, has recently accepted a position with the Semett Salvoy Coke Corporation of Buffalo, N. Y.

O. P. Pile, formerly connected with the Davidson Coal and Lumber Co. as superintendent, has been appointed by Gov. Roberts as chief mine inspector for the State of Tennessee succeeding **A. W. Evans** who recently resigned.

James E. Burch has been appointed a special agent in the coal section of the Geological Survey.

C. C. Beury of Charleston, head of the Beechwood Coal & Coke Co. as well as of other companies operating in the New River field was a visitor in the Cincinnati market recently.

S. L. Sherer, St. Louis, Mo., for many years treasurer of the Big Muddy Coal and Iron Co., has resigned to accept the position of administrator of the St. Louis Public Museum.

John Boring, for the past year mine foreman for The Boon County Coal Corporation, Sharples, W. Va., has resigned to accept a similar position with the Rockhouse Coal Co. at Blackey, Ky.

J. A. Paisley, president of the Valley Camp and J. A. Paisley Coal companies, operating mines in Belmont County, headquarters Cleveland, left recently for a six weeks sojourn in southern California.

David P. Burns, formerly salesman for the Weston-Dodson & Co., has connected with the Tuttle-Burger Coal Co. as assistant treasurer, Jan. 1, 1921. Mr. Burns was formerly chief of the coal bureau on the staff of Regional Director Smith, U. S. Railroad Administration, Eastern region, and for a number of years previous to that time was connected with the coal traffic department of the New York Central Railroad.

Oscar Robey has been appointed day dispatcher of the Consolidated Coal Co. at Fairmont, succeeding **Frank J. Jackson**, deceased, who served the company most faithfully for a number of years.

R. A. Johnson of the Crescent Fuel Co. has returned to Fairmont from Pittsburgh, accompanying his wife who recently underwent an operation in the Pennsylvania city.

W. C. McQuown, connected with A. R. Hamilton & Co. of Pittsburgh was a recent visitor in the Fairmont (W. Va.) field.

Samuel D. Brady, Jr., of Fairmont has been added to the list of directors of the Abrams Creek Coal & Coke Co., his father, Samuel D. Brady being at the head of that company.

H. H. Staggers, Fairmont district manager of A. R. Hamilton & Co. of Pittsburgh, and Mrs. Staggers have returned from a trip to White Sulphur Springs, W. Va., where they spent two weeks.

C. H. Jenkins, secretary and treasurer of the Hutchinson Coal Co. and a director of the National Coal Association, was called to Washington during Christmas week by business connected with the National Coal Association.

James Maloney of Huntington, head of the American Export & Inland Coal Corporation, was in Eastern markets the latter part of December on a business trip.

James Poindexter has resigned his connection with the Gay Coal & Coke Co. to accept a post with the Kanawha Valley Coal Company at Charleston. He will probably be assigned to the southern territory of the company.

Industrial News

Seattle, Wash. — The Hallidie Machinery Co., L. C. Smith Building, has been appointed the representative of the Conveyors Corporation of America, Chicago, formerly the American Steam Conveyor Corporation.

Chicago, Ill. — The Star Brass Works, manufacturers of spray cooling systems, painting and spraying machinery, announces that on and after Jan. 1, 1921, the company name will be changed to Binks Spray Equipment Company.

Obituary

R. L. Pepper, coal dealer, is dead of pneumonia, at his home here. He leaves a wife and two children. He was fifty-five years of age.

Francis Critz, superintendent for the Philadelphia & Reading Coal and Iron Co. here, aged 64, died after attending a banquet in Pottsville.

Frank X. Preyer, New Philadelphia, age 39, a local coal operator, was recently killed when his automobile was struck by a traction car near the city.

Jos. L. Scanlon, with the Superior Coal & Dock Co., St. Paul, Minnesota, died last week from blood poisoning which resulted from a boil.

Charles H. Babcock, Buffalo, for more than 50 years in active coal jobbing in Rochester, as a member of the firm of H. H. Babcock & Co., which bears his father's name, died recently, aged 72 years. The firm is one of the largest in the city. Mr. Babcock had been president of the Lincoln National Bank of the city till it was merged with the Alliance Bank. He was also long a member of the State Forestry commission.

Andrew Johnson, head of the coal firm of Andrew Johnson & Son at Stratford, Ontario, for eighteen years, died recently, aged 75 years. He was born in Ireland, but came to America when 21 years of age, and settled in Stratford.

Coming Meetings

The **Northeast Kentucky Branch of the Kentucky Coal Mining Institute** will hold a meeting Jan. 7, 1921, at Pikeville, Ky.

National Retail Coal Merchants' Association. Fifth conference of executives at La Salle Hotel, Chicago, Ill., will be held on Jan. 17 and 18, 1921. Secretary-Manager, Ellery B. Gordon, Philadelphia, Pa.

American Institute of Mining and Metallurgical Engineers' annual meeting will be held in New York, Feb. 14 to 17, 1921. Secretary, Bradley Stoughton, 29 West 39th St., New York City.

The Wholesale Coal Trade Association of New York, Inc., will hold its annual meeting in New York City, Jan. 18, 1921. Secretary, Charles S. Allen, 90 West Street, New York City.

American Society of Civil Engineers will hold its annual meeting Jan. 19 and 20, 1921, at its headquarters, 33 West 39th St., New York City. Acting secretary, Herbert S. Crocker, 33 West 39th St., New York City.

Northwest Mining Congress will hold its annual convention Feb. 28 to March 5, 1921.

Northern West Virginia Coal Operators' Association will hold its annual meeting Feb. 8, 1921. Secretary, H. S. Rogers, Fairmont, W. Va.

Pittsburgh Vein Operators' Association of Ohio will hold its annual meeting, Feb. 14, 1921, at Cleveland, Ohio. Secretary, D. F. Hurd, 415 Marion Building, Cleveland, Ohio.

American Institute of Electrical Engineers and American Institute of Mining Engineers will hold a combined meeting of the local sections on Jan. 21, 1921, at Pittsburgh, Pa.

Canadian Institute of Mining and Metallurgy will hold its annual meeting March 2, 3 and 4, 1921, at Ottawa, Ontario, Canada. Acting secretary, R. R. Rose, Montreal, Quebec, Canada.